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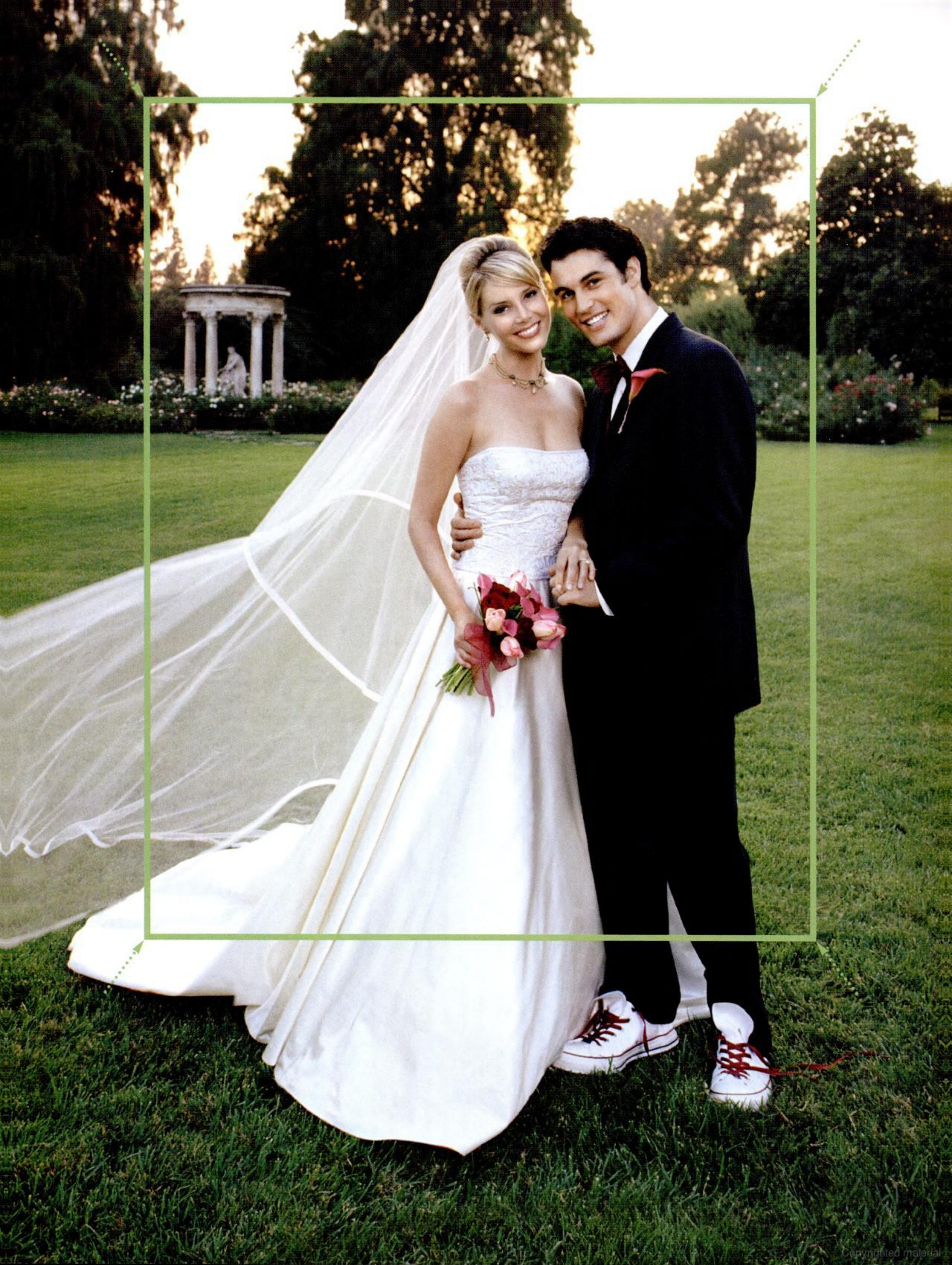
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Release Notes

This Release is Final

I'm no fan of poetic goodbyes, so I'll just come right out with it: These are my last Release Notes for *Maximum PC*. Next month I'll be handing over the helm to a new editor-in-chief, and beginning in earnest my new job as editorial director of our company's technology magazines. I'll be supervising the *Maximum PC* team to help them perfect the most exciting PC hardware magazine this planet has ever known, but my day-to-day editorial remit will be limited to a single column in the Quick Start section.

That's right, Phillips haters, you *still* haven't seen the last of me!

The magazine's new editor-in-chief is a tech veteran named George Jones. George got his start at *PC Week*, and has also been the editor of CNET's Gamecenter channel, and editor-in-chief of *Computer Gaming World*. Obviously, George's unique perspective will be invaluable in 2004 when we see the first games that qualify as true programmable shader masterpieces. But George is also a PC hardware junkie, so no one need worry that the magazine will go off the deep end with gaming coverage. George knows what drives the passions of our core readership, and every issue of *Maximum PC* will cover the entire hardcore hardware picture.

Before I leave, I want thank my incredible team of editors and designers, each of whom works extremely hard to make *Maximum PC* the best it can possibly be. I've put each one of you through hell, but I know the pressure has resulted in a better magazine. I also want to thank all the people who've engineered the fascinating products I've helped cover over the years. You've created a dream job for this technology fanatic.

But most of all, I want to thank our readers. Not only our closest friends—like Mark "Chamsalot" Miller, Vern Earlywine, Staff Sergeant Christopher Paul, and all the other guys and gals who've supported us over the years—but also the readers who habitually harangue us, and the readers who've outright attacked us. Each of you provided me with an experience that has made me a better editor.

I want to promise everyone that we will continue to work our asses off to make every single element inside this magazine the best it can possibly be—the best writing, the best photography, the best criticism, the best analysis, the best frontline intelligence. Working on *Maximum PC* is all about making sure *your* questions are answered, and that *your* magazine needs are filled. We make our fair share of mistakes, but I believe that anything is better than mediocrity, and even risks that end with a dull thud are risks worth taking.

Thanks for the wonderful times, readers, and please join me in looking forward to a very exciting magazine ahead!

—JON PHILLIPS
jon@maximumpc.com

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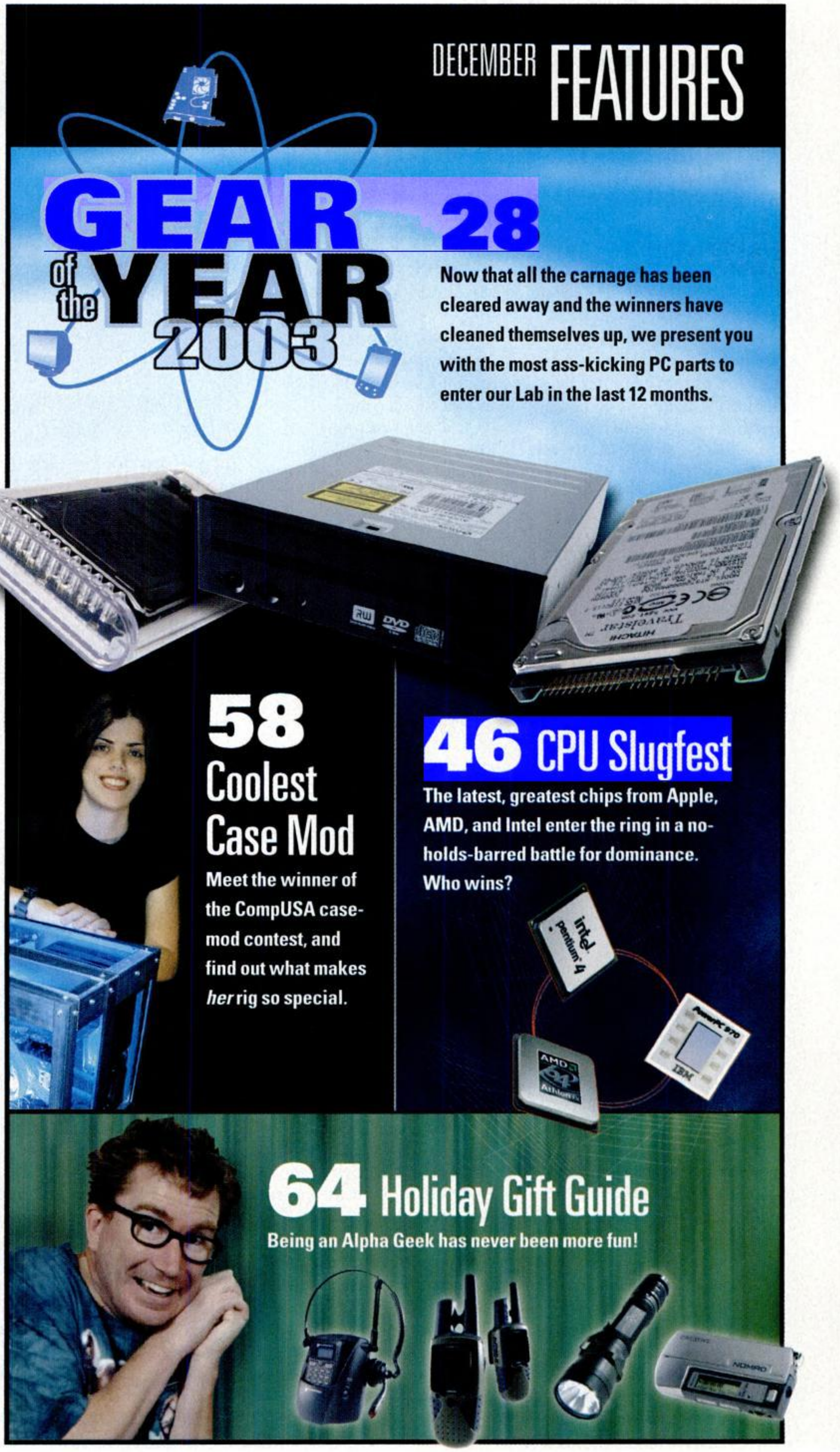

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In/Out

You write, we respond

NO, TOM, THIS DOESN'T GRANT YOU ANY TYPE OF SPIRITUAL "GET OUT OF JAIL FREE" CARD

I just renewed my subscription, and Thomas McDonald's recent Game Theory column is a good example of why. I am a nun. As a kid I would gladly have applied to Starfleet Academy, but as a missionary sister I've found a real-life way to "seek out new worlds" and "boldly go." I easily identified with Mr. McDonald's struggle to accept comics, action figures, and a love of science fiction and fantasy as part of his adult life. Thank goodness we worked through those issues, right?

What I have consistently appreciated about Mr. McDonald's column is that his values shine through: His review of *Sims Online* is an example. One parting thought: I doubt St. Paul would have minded if we grown-ups keep our toys. The one Paul served said we needed to become like children to enter the kingdom of heaven. Thank you all for putting out a magazine that is, if nothing else, a lot of fun to read!

—SR. DEBORAH WILSON, MSBT

WHY NOT A 9800?

I understand that you used an ATI All-in-Wonder 9600 Pro in your Entertainment Center PC [November 2003] instead of a 9800 board because of power issues. I also know the 9600 board will be slower in games than the 9800. But how do the boards' video-capture abilities compare? Is the 9600 just as good as more expensive cards in video-capturing abilities?

—WOLVERINEKID

TECHNICAL EDITOR WILL SMITH RESPONDS: The 9600 and 9800 share similar hardware, and use exactly the same software, so image quality for capture should be virtually identical. The 9600 even has one feature that the 9800 lacks: an FM tuner for radio time-shifting.

DLP PROJECTOR DISAGREEMENT

In your November issue cover story you say that DLP projectors are better than LCD projectors in every way. That's completely wrong! While contrast ratio in DLP is much higher than on LCD, LCD is rapidly improving, and you didn't mention the "rainbow effect" at all. The rainbow effect affects 10 to 20 percent of all people who view DLP projectors. If the DLP affects a user, headaches and other annoyances will plague their viewing experience.

—HOWIE UMAN

TECHNICAL EDITOR WILL SMITH REPLIES: We've heard reports of the rainbow effect as well, but haven't been able to find anyone who suffers from it. It's usually described as a shimmering rainbow effect over the entire screen. We think that the actual affected numbers are much lower, especially with newer technology. Newer projectors feature a faster color wheel than first-gen products, which minimizes the problem.

BUT DOES IT FIT?

I just read your November cover story, and I was a bit surprised that you chose the Radeon AIW 9600 Pro to put into your small formfactor home theater PC, considering some folks online had problems with the same board and case. Did you guys actually build the system, or just choose parts for the article? I don't mean to be a pest, but I was just curious after hearing about the problems people were having.

—PUNKY01

TECHNICAL EDITOR WILL SMITH RESPONDS: Of course we built the machine, Punky! We did have a smidge of trouble getting the 9600 All-in-Wonder into the Shuttle case. We had to use a little more force to get it into the slot than we normally like to, but the board went in fine, as you can see in the photos from the article.

MORE ON POCKETPC-SIZE VIDEO

I thought your November article on compressing a video to play on a Pocket PC was really cool, but a freeware utility called *DVD Decrypter* will save you a lot of time. It rips the contents of a DVD to M2V and AC3 streams that you can send right to *Windows Media Encoder*, without having to handle VOB files and all that.

—REZA PALAVI

FEATURES EDITOR LOGAN DECKER REFLECTS: We received a ton of mail regarding our how-to on formatting a full-length movie to fit on your Pocket PC, and we were able to draw two conclusions from the letters. One, our readers love the idea of being able to watch movies on their handhelds. Two, not many realize that using software to decrypt the contents of a DVD is illegal in the United States.

Now, common sense says that we should be able to rip a movie from a DVD we purchased and play it back on a portable device, just like we do with audio CDs. But the Digital Millennium Copyright Act (DMCA) disagrees, and thus we can't advocate the use of seemingly benign apps like *DVD Decrypter*, *AnyDVD*, or *SmartRipper*.

If you don't like it, we recommend you let your Representative and Senator know how you feel about the DMCA. They are probably unaware that there are legitimate uses for DVD decryption. In fact, many of them are probably unaware that movies are now filmed in color.

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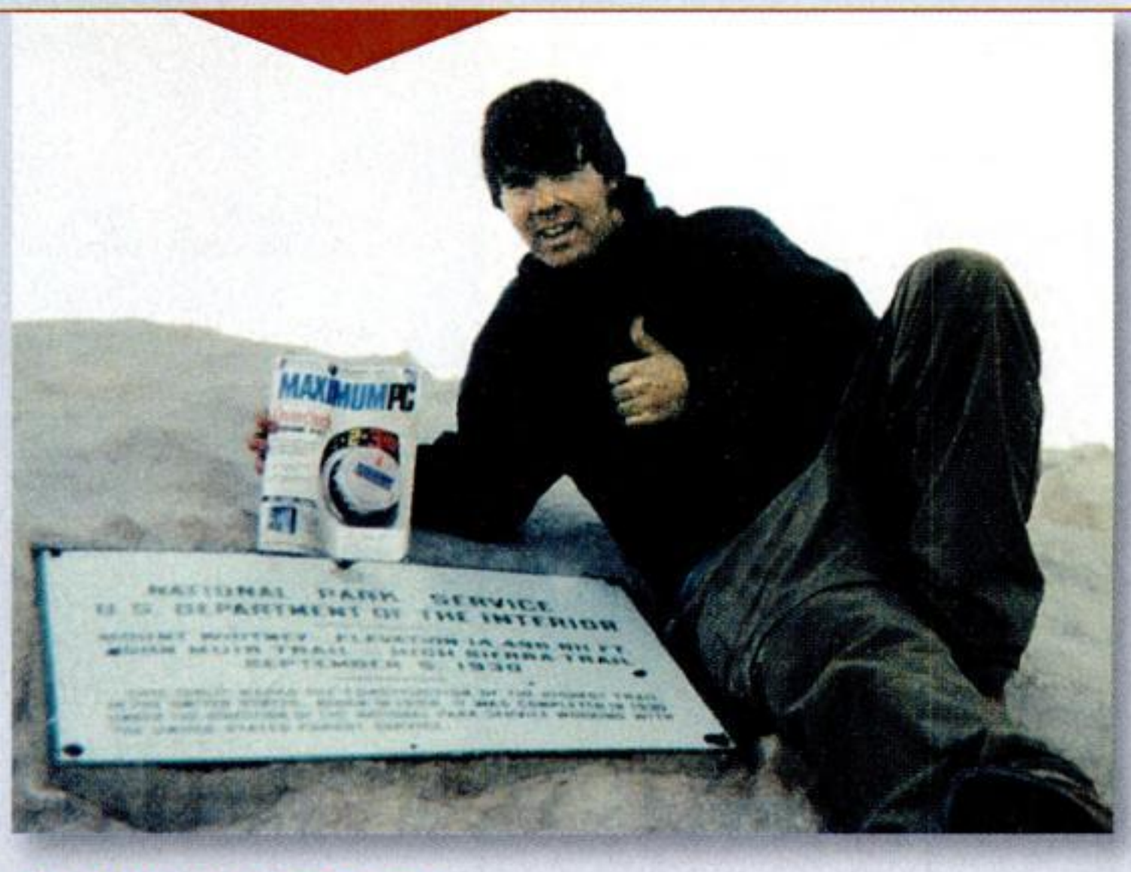

MAXIMUM PC AT AN ALL-TIME HIGH

First off, I want to thank you guys for putting out such an awesome magazine. *Maximum PC* replaced my mom's *Yahoo!* subscription when that mag went kaput, and it truly was love at first sight. Anyway, I thought you guys might enjoy this picture. This summer I went on a week-long backpacking trip to summit Mt. Whitney (at 14,496 feet, the tallest summit in the continental US), and the only reading material I took along was my latest issue of *Maximum PC*. The magazine sure took a beating after rereading it about 10 times, but I enjoyed it every time through.

—BOB SOMERS

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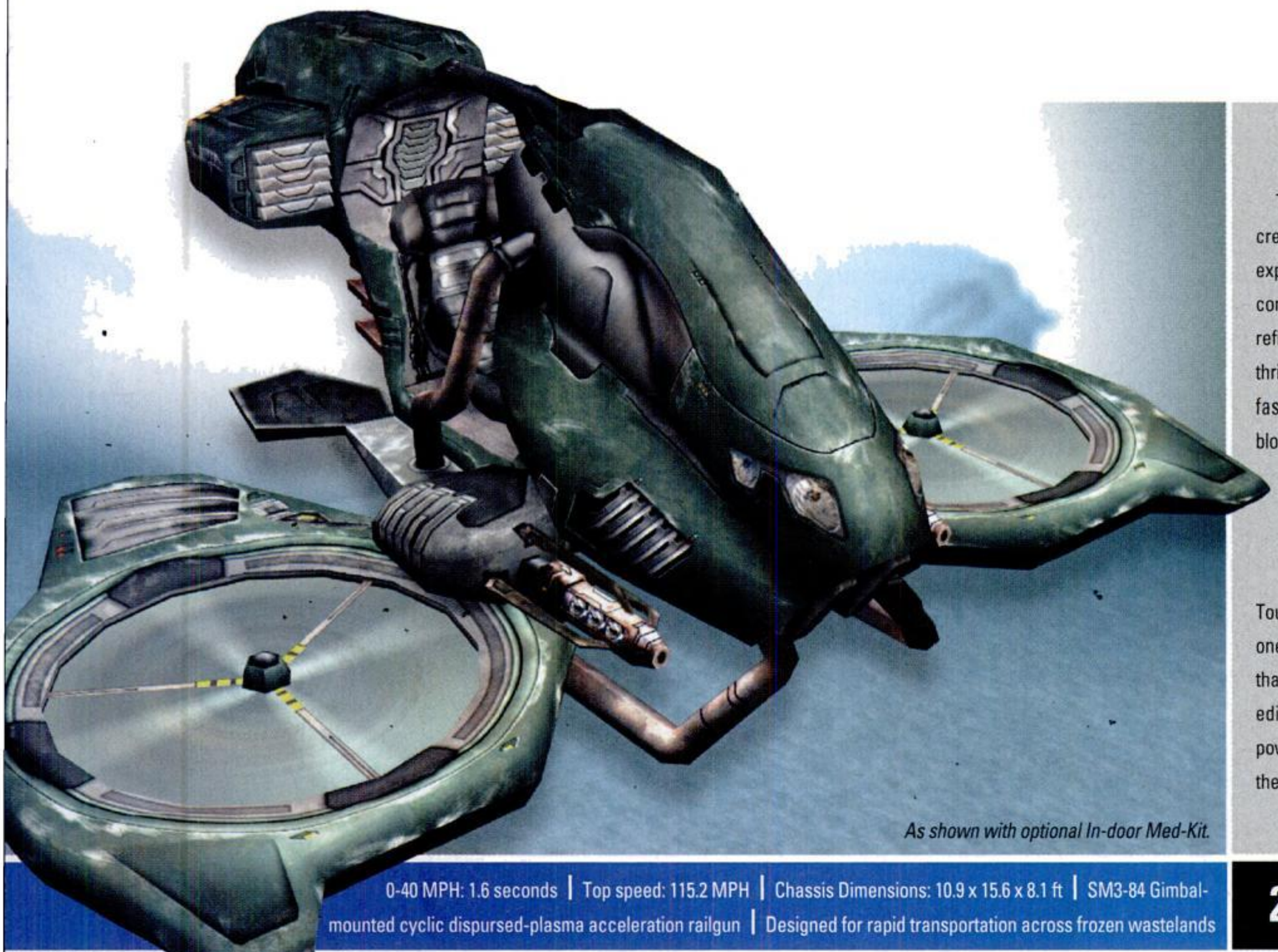

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SIMMER DOWN, BOYS... I THINK WE CAN ALL AGREE THAT MR. FOREMAN HAS SUFFERED ENOUGH

A note by Harold Forman in November's In/Out section slammed Jon Phillips for a copy-editing error that appeared in the October issue. Forman astutely noted that an apostrophe was omitted in the word "were." His razor-sharp analysis of the error observed: "'Were' means something totally different than the conjunction 'we're'."

Little wonder that the circles in which Forman moves acknowledge his "way with words."

While the context of the error did make it particularly ironic, I'd like to suggest that Mr. Forman lower his nose from its present haughty perch and stick it in a good grammar book. The misspelled "conjunction" that so disturbed Mr. Forman ("we're") is not a conjunction at all, but rather a contraction.

Walk the halls of English grammar with some humility, Mr. Forman, and show a bit of charity toward the harried, human copy-editor, lest you trip publicly over your own "way with words."

—BRADFORD TERRY

> *"IS IT YOUR POLICY NOW TO RUN THIS TYPE OF CHEAP-SHOT ANTI-AMERICAN PROPAGANDA?"*

BETTER RED THAN DEAD?

I was very shocked and offended at the "ad" on page 39 of your November issue. This ad has a picture of the White House with a Commie flag over it (and lower in the page a little postage stamp-size logo for the game *Civilization*). Sirs, this is not an ad for a game—it is a political statement, and a treasonous one at that. Is it your policy now to run this type of cheap-shot anti-American propaganda when this county happens to be at war?

After seeing this ad I will never, repeat never, buy a Firaxis or Atari game again for me or anyone else, and you can relay that thought to your advertisers. If you're going to continue to run ads of this ilk, maybe you should change the name of your magazine to something more appropriate, like *Le Socialist Workers People's Review of Maximum Decadent Kapitalistic Komputers*.

—RAY C. SCHULTZ

EDITOR-IN-CHIEF JON PHILLIPS RESPONDS: It may be a disturbing image, Ray, but I don't think it's treasonous, at least not in the legal sense of the word. Regardless, I should point out the copy that runs with the image: "But for a few decisions, the world could be a very different place." Now, I don't know about you, but I interpret that as an endorsement of America's Cold War policy, which pretty much had the widespread support of our nation's most passionate self-proclaimed patriots. Regardless, I think we all know the game publisher's intent was ironic, not political.

As for regulating the ads that appear in the magazine, we are sometimes a victim of the stringent firewall that we place between the advertising and editorial staffs of the magazine: We don't have the foggiest idea of what the ads look like until the magazine comes back from the printer (nor does the ad staff have any idea what specific content appears in the editorial pages). Sometimes this firewall really bites us, but the *Civilization* ad wasn't one of these cases.

MAD PROPS FOR MOZILLA

Your Head2Head column on web browsers in the November issue nailed it on the head when you said that *Mozilla* was better than *Internet Explorer*. The tab feature, free pop-up controls, and numerous skins available rock! I switched to *Mozilla* six months ago and found that sacrificing a bit of speed for these benefits was a no-brainer, but compatibility issues gave me a big headache. Many web pages with certain scripts or Java wouldn't load, or would cause *Mozilla* to crash. I considered going back to *IE*, but I didn't want to lose the advanced features I'd grown accustomed to, so I went searching for another browser.

What I found was the *Avant Browser* (**www.avantbrowser.com**). It updates *Internet Explorer's* primitive interface to a tabbed wonderland. The practical upshot is that you keep the speed and compatibility of IE, and gain tabbed browsing, pop-up controls, and skins, just as *Mozilla* has. It's freeware and under 3MB to download. I know this isn't a "true" standalone browser, but how could you not even mention *Avant*?

—CHARLES PECK

TECHNICAL EDITOR WILL SMITH RESPONDS: We didn't include the *Avant* browser specifically because it's an extension of *Internet Explorer*, and not a standalone browser. It does add much *Mozilla*-like functionality to *IE*, but it still lacks the spiffy *Mozilla* extensions. You should also know that since we ran that story, Mozilla released *Firebird 0.7*, which is significantly more stable than earlier releases. We haven't had any compatibility problems with the newer version yet either.

SECRET WEAPON SENSITIVITY

Am I seriously the only person that thinks the additions to *Battlefield: 1942* (from the *Secret Weapons Of WWII* expansion), such as the motorcycle with machine gun sidecar and a gunner with a freakin jetpack are extremely disrespectful? Do the people at EA not know how many soldiers fought and died in that war? I think it's time for the people at EA who were responsible for this to pull their heads out of their asses and show some respect.

—MIKE MCKAY

continued on page 10

COMING NEXT MONTH IN THE CUTER THAN BABY NEW YEAR JANUARY ISSUE OF MAXIMUM PC

Extreme Hardware
Our PC experts are poised to reveal 2004's hottest new components, so don't you dare upgrade until you've read this report! Includes a 10-point plan for staying ahead of the tech curve, and, if all goes well, a special preview of the world's most controversial uber-PC.

The 2004 Softy Awards!
Which applications and utilities are worthy of your rig? Find out in *Maximum PC's* Second Annual Softy Awards. Our editors present their very favorite software—from well-known apps to obscure digital widgets—and explain in detail what makes each one rise above all the others in its category.

The Maximum PC Challenge: The USB Key Endurance Test
You trust your personal data with these flash-memory thingies—but should you? It's time we found out just how rugged these little pups are. Can they take the heat? Can they endure the cold? Can they survive a dunk in the john? Our editors go out in the field to answer these very questions.

PLUS: In our most poignant Head2Head ever, we inspect and dissect the top four online music downloading services. (The legal ones, that is.) Find out who's got the most music, the lowest prices, and the best policies—all without spending a dime of your own hard-earned cash.

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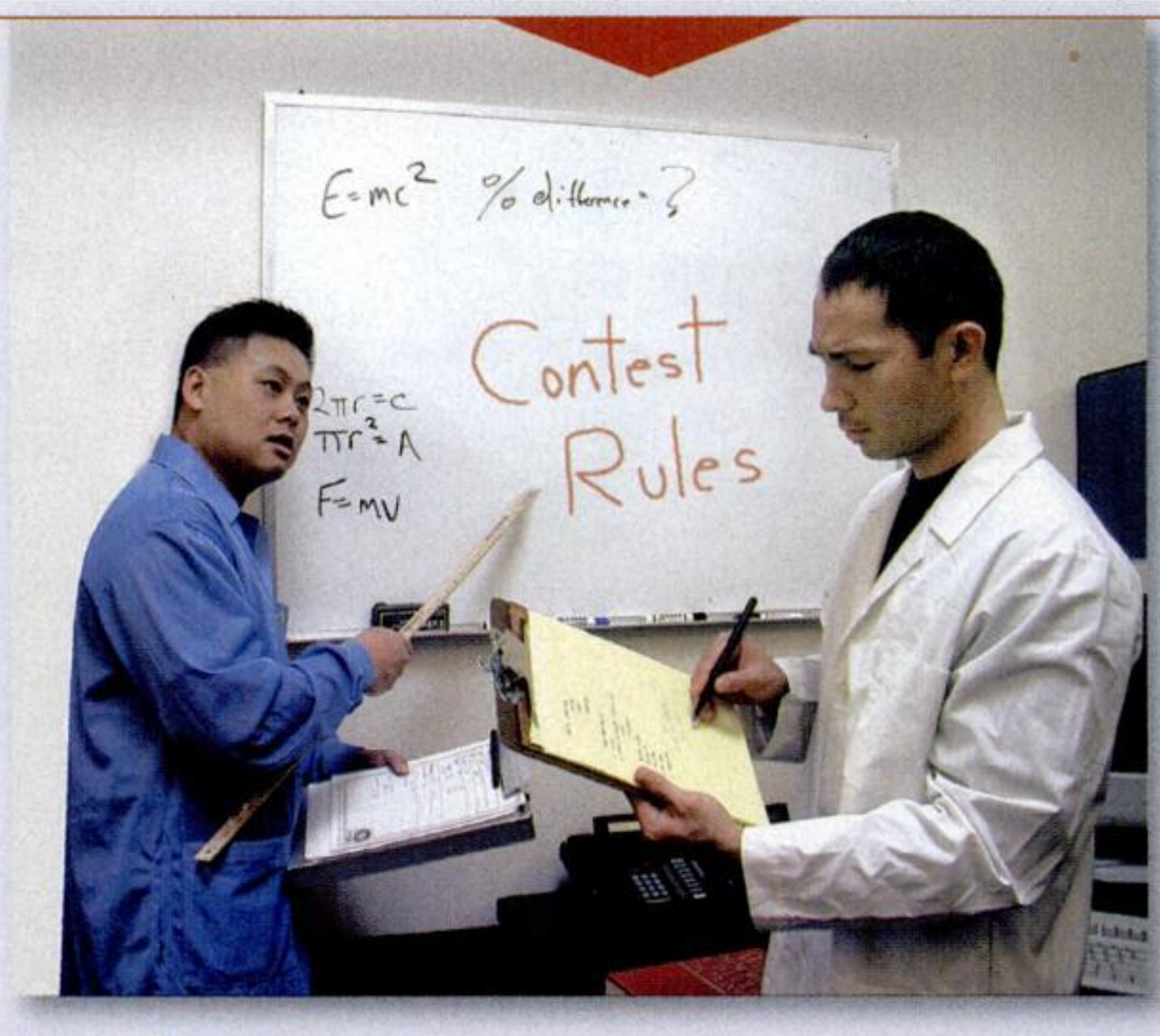
WAR MONGER GORDON MAH UNG RESPONDS: Come on, Mike, haven't you ever found yourself sitting on the couch at 2 a.m. eating Fritos and watching some History Channel special on the secret weapons of WWII, and wondering what would have happened if one of those weapons had actually been produced a year earlier, and used in the war? I think someone at the game's development house also had the same experience, except probably without the Fritos.

AND DID YOU KNOW THAT "HOBO" STANDS FOR "HOMEWARD BOUND"?

Your magazine often talks about "mobos" without explaining what a "mobo" is. I am a technical writer by training. If I had introduced an unusual term without explaining what that unusual term is, I would be tarred and feathered! Also, when I talk about something, I would like to know what I am talking about rather than to be some malaprop that goes slinging words around capriciously and irresponsibly.

—JON K. EVANS



PHYSICS IS PHUN!

I hate to follow in the footsteps of a nitpicker like Harold Foreman, but I noticed in the "Have You Seen Our Missing Predicates" gag column on page 79 of the November issue that there's some heavy think-tank work going on involving a whiteboard. Unfortunately, whoever did the work on the board must have gone to some mamby-pamby liberal arts school, like Yale. I'm reasonably certain it's momentum that equals mass times velocity, not force.

—J. CRIZ

EDITOR-IN-CHIEF JON PHILLIPS RESPONDS: Ah, yes. Mobo. That's our own little abbreviation for the word motherboard. In fact, I like to think that *Maximum PC* coined the term, and that all the other web sites and magazines that now use it on a daily basis are actually following our lead. But I don't have any proof of this. If one of our readers would be kind enough to prove me wrong by showing me an example of the word mobo printed prior to June 1996, I'll award that person a signed copy of our "lost first edition" which was never released to the public. But until we hear otherwise, we'll just continue in our belief that the word mobo is ours, all ours, and no one else's.

CD SHATTERING: OUR LONG NATIONAL NIGHTMARE IS OVER

In your review of the MSI 52x CD burner in the October issue, you mentioned that "like the PlexWriter, the MSI boasts a reinforced front bezel in case of a disc shatter." How do discs shatter and do most drives have reinforced bezels to deal with that? What are the chances of a CD shattering?

—PETER

OPTICAL EXPERT LOGAN DECKER RESPONDS: The chances of a disc shattering in your drive are not great, but if it happens, it's a disaster. Ever tried to snap a CD you hated in two? The polycarbonate shatters into bits shaped like razor-sharp bat teeth, and the data layer flakes into a million pieces that are almost impossible to clean up. That's the end of that drive. Even worse, it's possible that the disc will actually blast through the bezel—we've seen videos of this happening. That's why MSI and Plextor now offer reinforced bezels as an extra bit of insurance against this kind of mayhem (as far as we know, these companies are the only ones doing so).

That said, we've tried countless times to get a disc to shatter with no success. We've even cracked the inner ring and repeatedly abused the disc. We believe that you should be concerned about disc shatter only if you consistently read and write discs at the highest speed and use spindled media. But even then, the risk is low.

CAN YOU TAKE IT WITH YOU?

I have had quite a few conversations about your choice of a winner for the CPL case modding contest ["Pilgrim In an Unholy Land," October 2003]. Lee Rakestraw's "You Can Take It With You" is not only "a little morbid," it is downright disgusting that someone should use a child's coffin to house a modded computer. In conversations about this mod with more than 20 people, no one thought that it was a good mod. The magazine should not have printed such a disgrace.

—JASON FAULCONER

WILL SMITH RESPONDS: I was one of five judges for this year's CPL case mod contest. Rest assured that the coffin mod was definitely not my first choice for the winner. In fact, the mod that I was most impressed with didn't even make the top three. Regardless of my personal feelings about the mod, "You Can Take It With You" was the contest winner, and it's our journalistic responsibility to report on it. ■

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➤ In the "When Handhelds Collide" article on page 14 of the November 2003 issue, the URL for Tapwave's *Zodiac* is incorrectly shown as www.n-gage.com. The correct URL is www.tapwave.com.

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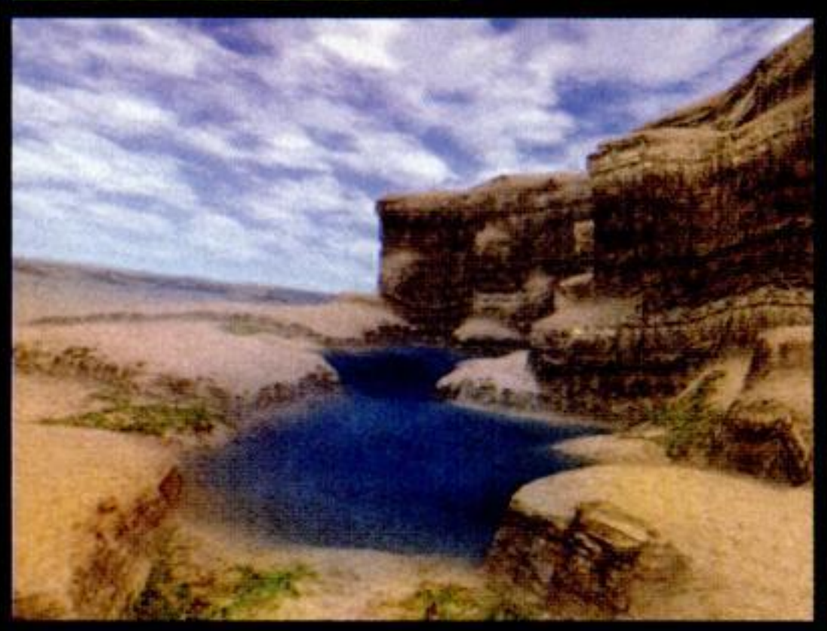

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TEEN T — CONTENT RATED BY ESRB — Animated Blood Violence

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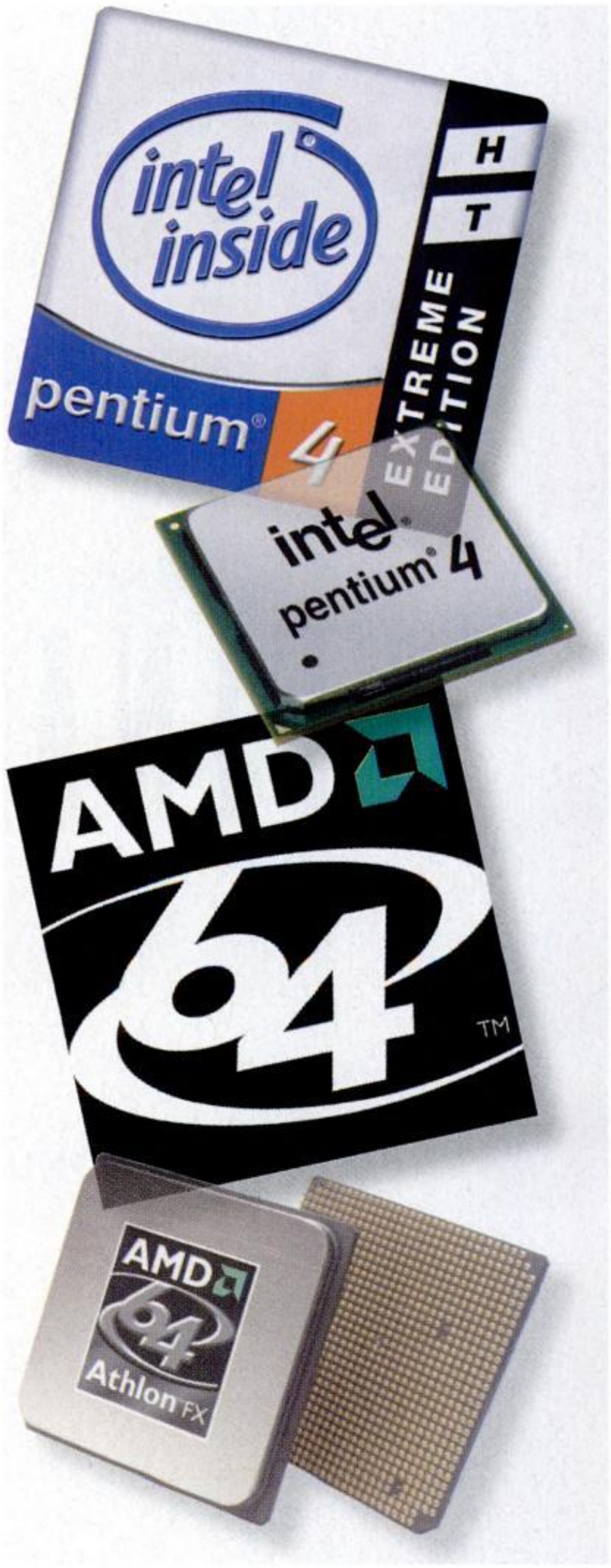
Quick Start

The beginning of the magazine, where articles are small

Server Chip, Gaming CPU: What's the Diff?

By reinventing their enterprise chips as consumer processors, Intel and AMD are banking on the "halo effect" to spur overall sales



It's a strategy that's done wonders for the sales of Corvettes, Michael Jordan Sneakers, and even Beanie Babies: If you can create an aura of brand exclusivity around a limited-supply product, consumers will not only tolerate higher prices, they'll go after the product in droves.

But as savvy PC enthusiasts already know, that's not quite the approach that Intel and AMD are taking with the launches of their new top-of-the-line CPUs. Intel's Pentium 4 Extreme Edition (P4EE) and AMD's Athlon 64 FX are both high-performers—no dispute there. And true enough, the two chip gargantuans are focused on selling small numbers of these extremely expensive CPUs to the upper echelon of power users. The new sales strategy, however, might be more the result of desperation than design.

"The desire for the leadership position is causing [Intel and AMD] to do unnatural things with server products. [Both] are selling server CPUs as limited-edition gaming CPUs," says Dean McCarron, principle analyst with Mercury Research. The reasons are pretty simple, McCarron says: "There has long been a halo effect in the PC industry: What's considered the fastest ends up benefiting the slower-performing parts within the same brand."

This isn't exactly a new phenomenon. Car companies have been banking on the halo effect for years. For example, the halo that hovers over Chevy's Corvette line also shines some light on the Monte Carlo line as well. You can call it "virtue by association." The Monte Carlo might not be an actual sports car, but surely it has some Corvette DNA streaking through its veins, right? Or so the optimistic buyer convinces himself.

Although PC power users may appreciate the fact that the new chips are based on high-end server procs, it's unlikely that anyone will appreciate the chips' pricing and availability. AMD's Athlon 64 FX-51 is currently selling for about $800. Intel's P4EE, due to hit the streets soon, is expected to hover around $900. Ouch.

AMD has even outlined a plan that will keep its FX series expensive and elite: When faster versions of the chip hit market, slower versions will be phased out quickly—thus consumers will never be able to buy second-fastest versions at a lower price, a convention with which we're all familiar. Intel says that it might adopt a similar sales strategy as well.

For the time being, both companies' chips are fairly hard to buy. AMD wouldn't release details on how many 64 FX chips it expects to produce by the end of 2003, but analysts and system manufacturers have predicted that 10,000 chips or so might reach consumers. That's a pittance compared with the 140 million CPUs sold each year.

McCarron says Intel will be in better shape because the company produces about 200,000 Xeon MP processors each year, and could easily pull all the P4EEs it might need from the Xeon's existing production run.

Still, analysts say that demand, and not availability, is the biggest question mark for both companies. Please consider that, according to Mercury Research, the majority of PCs sold in the last six months featured 2000+ Athlon XPs or 2.4GHz P4s. Not quite enthusiast-level CPUs, eh? We can only assume that Intel and AMD are banking on the mindshare created by their über-chips to supercharge their entire product lines.

"Even though [power users] represent a small percentage of the market, they are disproportionately influential," says Roger Kay, a hardware analyst with IDC. "These guys are the modder gamer guys who can get down in the weeds with the innards of the PC, and a lot of other people look to them for guidance. They're not going to only influence co-workers and the IT shop, but also their friends and family."

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Apple Debuts iTunes for Windows

Can *iTunes'* generous policies beat "free" music?

At a San Francisco media fete that included a live performance by singer Sarah McLachlan, Steve Jobs introduced Apple's formerly Mac-only *iTunes* jukebox for Windows. Jobs used the slogan "Hell Froze Over," to proudly illustrate the unexpectedness of the Windows port. And according to Jobs, the PC and Mac versions of *iTunes* are identical.

Available for free at **www.itunes.com**, Apple's media jukebox offers unlimited, free MP3 encoding up to 320Kbps (variable bit rate encoding is also an option). You can also encode to Apple's preferred AAC format, as well as AIFF and WAV. Other features offered by *iTunes* include cross-platform music sharing on a local network, visualizations, support for streaming radio over the Internet, and auto-sync with PC iPods, of course.

Make no mistake: This free application wasn't developed as just a good-will gesture—*iTunes* the app facilitates *iTunes* the online music downloading service. The *iTunes* service has no subscription fee, and the price (99 cents per song) and policy (unlimited burning to CD, unlimited downloading to portables) are the same for every track, be it by Beyoncé or Los Baby's.

Apple also took the opportunity to tout a few new fancy *iTunes* features, such as an "allowance" system, which automatically charges your credit card every month for a predetermined amount that you can then use to buy music. Jobs explained that this strategy would help parents wean their little ones off file-sharing without actually giving them the credit card number. The service also offers gift certificates that can be e-mailed or sent by post.

iTunes now also stocks audio books, with a catalogue of more than 5,000 already available online. (In classic Apple style, audio books will always resume playback where you left off, regardless of how many times the same book has been transferred from your PC to your iPod, and vice versa).

Despite the line-up of rock-star spokespersons who joined Apple's event via satellite, and the appearance by Sarah McLachlan, we're going to curb our enthusiasm for *iTunes* while we compare it with other PC-centric services like *Rhapsody* and *Napster 2.0*. Stay tuned for the results next month. In the meantime, go ahead and download *iTunes* for Windows—it's a pretty slick number.

One-stop shopping: *iTunes* is your jukebox, your iPod manager, and your ticket to downloading music with a single click.

FUN-SIZE NEWS

Hello Kitty!

You know the story. Napster came and conquered. The RIAA came and conquered Napster. Attempts to remake the service a legal one were unsuccessful. Well, the cat is back. After buying up the remains of the defunct service, Roxio launched *Napster 2.0* on October 29, 2003. The new online music service (www.napster.com) boasts a catalog of more than 500,000 songs from five major record labels. Each track is .99 cents or $9.95 per album. There's no charge for the standard service, but for $9.95 a month, members can access "unlimited listening and downloading," as well as Internet radio stations and playlist sharing. We're performing a physical on the new kitty now—check back next month for the results.

Longhorn Slips to 2006

At a partner conference in October 2003, a number of Microsoft executives casually mentioned that Longhorn, the next iteration of the Windows OS, wouldn't ship for another three years. Naturally, the revelation also suggests that products and features Microsoft intended to debut with Longhorn, including Longhorn Server, Windows File System (WFS) and the next iteration of *Internet Explorer*, won't be seen until that time as well. Until then, users are encouraged to help themselves to service packs.

We Call It Maize

Take one "free" AOL CD, multiply it by 10 million, throw 'em all in the trash, and you've got an environmental debacle. Sanyo Electric Co. may have the answer—the company has developed a biodegradable compact disc made of corn. *We are not making this up.* Eighty-five kernels of corn are needed to produce a single 12cm compact disc that's compatible with current optical drives and CD players, and is expected to break down into water and carbon dioxide after 50 to 100 years. Mass production of the so-called "MildDisc" for prerecorded use is expected to begin at the end of this year, with recordable, rewriteable, and DVD versions to follow soon thereafter.

Airbags For Your Notebook

Bump. Crash. Those are the last sounds your notebook hears before it dies (that, and a string of obscenities coming from its owner). Well, IBM knows what a klutz you are, and has developed what it calls the IBM Active Protection System. A microchip on the mobo detects system acceleration (like when the laptop falls off a lap) and immediately parks the hard drive's read/write heads until the portable is stabilized—in other words, when it lands. IBM hopes this new technology will reduce incidences of hard drive failure following such unfortunate mishaps.

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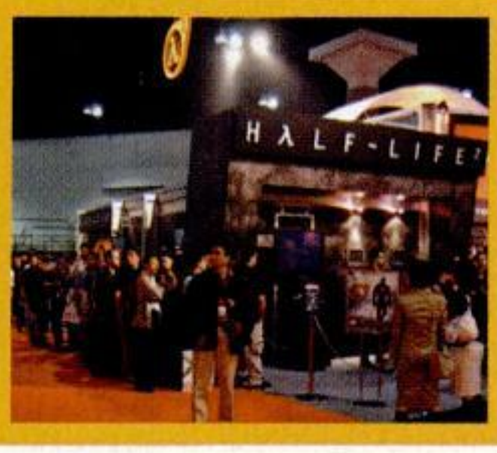
The Long Road to Half-Life 2

The story of one game's strange, erotic journey through development hell

It takes a special something to bump *Doom 3* from the mantle of "most eagerly anticipated game," and that's exactly what happened when Valve announced *Half-Life 2* earlier this year. However, the months following the game's announcement have included an unprecedented level of drama. Here's the basic rundown.



May 2003

Valve began working on *Half-Life 2* shortly after the original game was released, but didn't say a word about it for five years. At the 2003 E3 gaming convention, Valve stuns attendees by announcing *Half-Life 2's* September 30, 2003 launch date.

June 2003

Gaming mags, such as *PC Gamer*, publish their accounts of the first *Half-Life 2* play tests. Highlights include a hyper-realistic physics engine and omnipresent DirectX 9 programmable shader effects.

August 2003

Maximum PC investigates how *Half-Life 2* will scale with different types of PC hardware, including CPUs and videocards.

Valve CEO Gabe Newell drops a benchmarking bomb on nVidia at an ATI press event when he claims that ATI's mid-level, $200 Radeon 9600 videocard outperforms the $500 GeForce FX 5900. nVidia counters by saying the drivers used weren't optimized for *Half-Life 2*, and guarantees top-class *Half-Life 2* performance. Newell promises a *Half-Life 2* benchmark on September 30.

September 10, 2003

September 30, 2003

At an industry gala on Alcatraz island, Valve and ATI co-launch *Half-Life 2* and the Radeon 9800 XT videocard. Neither the benchmark nor the game is anywhere in sight.

October 2, 2003

Valve announces that its office network has been compromised, and that a large amount of Valve intellectual property has been stolen, including significant portions of the *Half-Life 2* source code.

October 3, 2003

Knowing that the breech to *HL2* servers could lead to multiplayer cheating and denial of service attacks, Valve begins the painstaking process of rewriting the game's source code.

October 7, 2003

Vivendi Universal, the publisher of *Half-Life 2*, announces that the game has been delayed indefinitely.

October 7, 2003

Maximum PC discovers that chunks of the *Half-Life 2* source code have been assimilated into the Matrix and are responsible for Agent Smith's abrupt personality change.

▶▶ FAST FORWARD BY TOM R. HALFHILL

Transmeta's Last Chance

Like its namesake who was stranded on a lonely island, Transmeta's Crusoe needs a rescue. The innovative notebook processor appeared in 2000 with promises of high performance and lower power consumption for mobile PCs. Unfortunately, Crusoe's performance has been lackluster and Intel is fighting back with the low-power, higher-speed Pentium M.

Transmeta suffers from what I call the "pecking order of magnitude": Intel sells about 10 times as many mobile processors as AMD, and AMD sells about 10 times as many mobile processors as Transmeta. That leaves Transmeta struggling for 1 percent market share. Now the company has a last chance to win a meaningful piece of the pie—its new Efficeon TM8000 improves on Crusoe and offers some cool new features.

Efficeon, like Crusoe, is an x86-compatible processor but not an x86 processor. Inside, it's a VLIW (very long instruction word) architecture that isn't compatible with anything. It runs x86 software by using what Transmeta calls "code-morphing software" and everyone else calls a software emulator, which translates x86 program instructions into VLIW instructions on the fly.

Code morphing is clever, but the downside is laggard performance—Crusoe has never delivered the speed that its clock frequencies imply. (And those clock frequencies haven't been very aggressive, either.) But with Efficeon, Transmeta is introducing numerous refinements that make emulation more efficient, and new support for Intel's SSE and SSE2 extensions will boost multimedia performance. The overall performance gap remains, but it's not as wide.

To narrow the gap further, Efficeon is more integrated than any other PC processor. Not only does it have the equivalent of a north-bridge chip with a DDR-400 memory controller, but it also has an AGP-4x graphics controller and a 200/400MHz HyperTransport interface to the south-bridge chip. These built-in features help relieve some system bottlenecks and save power.

Even more fascinating is an enhancement to Transmeta's power-saving LongRun technology, which varies the chip's voltage and clock frequency in response to software demands. In addition to voltage/frequency variations, Efficeon processors can automatically change the transistor threshold voltage—the voltage at which the transistors switch between on/off states—to reduce leakage current. At lower clock frequencies, Efficeon raises the threshold voltage, which leaks less current and saves power. At higher frequencies, Efficeon lowers the threshold voltage, so the transistors can switch more rapidly.

Efficeon is a worthy contender, even against Intel's second-generation Pentium M (Dothan). However, if Efficeon cannot surpass Crusoe's sales, Transmeta will probably retreat from mobile PCs, focus entirely on the embedded-processor market, and seek financial refuge in a merger with a larger company.

Tom Halfhill was formerly a senior editor for Byte *magazine and now an analyst for* Microprocessor Report.

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the creators of Age of Empires.®

AGE of MYTHOLOGY® The TITANS EXPANSION

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Microsoft game studios

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TEEN T Blood Violence CONTENT RATED BY ESRB

Turning Pirates Into Promoters

Macrovision's latest copy-protection scheme hangs pirates on their own hooks

You're crawling on your belly through thick underbrush. The enemy knows you're in there somewhere, and you can hear his bullets—*phut phut phut*—pummeling the ground as he tries to flush you out. You wipe the sweat from your forehead, and slowly raise the sniper scope to your eye. You have him in your sights, closed in so tight you can practically touch the scar across his right eyebrow. He's a *goner*. You pull the trigger...and miss.

Frustrating, isn't it? That's the idea. If you weren't playing a pirated copy of the game, you wouldn't have missed.

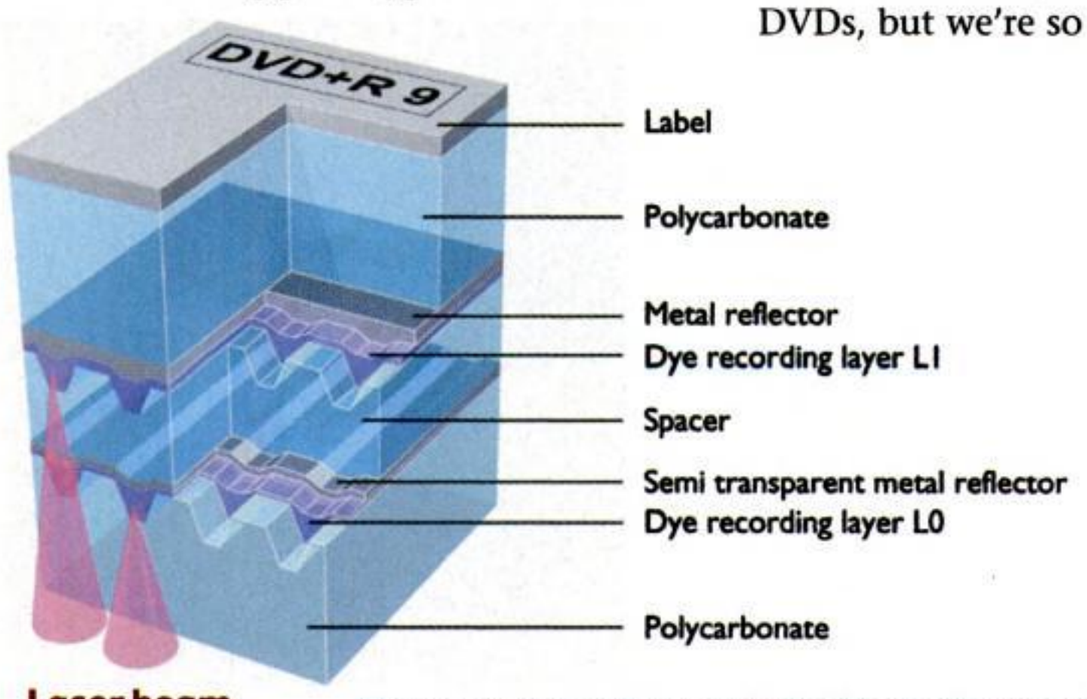
Rather than try to create new copy protections that get cracked moments after release, Macrovision (in conjunction with the developer Codemasters) is taking a different approach with a scheme the company calls "Fade." Game discs are embedded with what appears to be a series of random scratches, but these hash marks actually create a particular pattern that the software looks for before the game begins. If you try to copy the game, your optical drive's built-in error correction will remove the "scratches," making the copied disc (as well as disc images intended for online distribution) identifiable as a duplicate. At first, gameplay is as it should be—after all, the developer wants you to get hooked. But in time, what should be easy field goals gradually become impossible to hit. A Porsche 911 suddenly begins to handle like a bread truck. And, hopefully, the frustrated software thief will become an eager consumer.

Double Your DVD Pleasure

Dual-layer recordable DVDs are on the way

There was a time when the technical obstacles to creating dual-layer recordable DVD seemed so insurmountable that manufacturers simply threw up their hands in defeat. But Philips and MKM (Mitsubishi Kagaku Media) have since demonstrated a working prototype of the dual-layer media which is allegedly compatible with DVD-ROMs and set-top players. What's more, the two companies expect drives and media to ship early in 2004!

At 8.5GB, the capacity of the write-once, dual-layer DVD+R discs will be slightly less than that of 9.4GB commercial dual-layer DVDs, but we're so exhilarated about pairing the media with *DVDXCopy*, we're willing to overlook the discrepancy.



The secret to the recordable dual-layer disc is a semi-transparent reflective layer that allows the laser to read the top layer reliably, but still refocus on the layer beneath it. Not actual size.

GAME THEORY BY THOMAS L. McDONALD

Tom McDonald Turns 100

The very first words of this column, written back in March 1996, were "I hate *Myst*." I know that because I'm a pack rat and have every column I've ever written, and I'm telling you this not to prove what a snotty writer I was at 27, but because this is my 100th column. I'm expecting my gold watch any day now.

Anniversaries may be meaningless milestones, but they do offer nice round numbers that give us a chance to look back. That first year I wrote about things like *Close Combat's* physics model, the anti-gaming crusades of Joe Lieberman (who, strangely, is now the only Democrat who doesn't immediately trigger my gag reflex), MMX (I am not explaining this), *Battlecruiser*, Peter Gabriel's *Eve* (nice guy—he's bald, you know), and other things that have vanished into the mists (or is that mysts?) of memory.

The best part about writing for magazines (aside from the money, of course) is that your work is out there, right away: It doesn't appear a year after you wrote it, as with books. The worst part is that your work is, ultimately, the Kleenex of the writing trade. There is no chance in hell anyone, ever, will want to read my opinions on *Hunter Hunted* ("a tired retread of a platform shooter") again. Even I don't remember the thing.

But I'm happy to have been part of this thing called Maximum PC from the very beginning. I like the magazine and the people involved. I get nostalgic because I can trace this very column back to the beginning of my career sometime around 1990, when I joined a flagging magazine called *Game Players PC Entertainment* just as my friend and editor Steve Poole was turning it into a success. That magazine became *PC Gamer*, which begat *CD-ROM Today* under Lance Elko's firm guiding hand, which begat *boot*, which begat *Maximum PC*, which brings us back to here. I wrote aggressively throughout the 1990s—a transformative time for computer gaming—and I enjoyed it.

And I still do, though I write less now. I've produced two kids (with the help of my lovely wife, of course) in addition to the 1000 or so stories I've filed, and they take much of my time. I've become cynical to some extent because I've seen it all before. My free time is more precious now, and a game has to be damn good to earn a chunk of it. Very, very few do any more, but the ones that do (*SimCity 4 Rush Hour* and *Jedi Academy* being the latest) still remind me why I got into this hobby in the first place. I'm glad these things can still entertain me. I'd hate to lose that.

And you know what? I still hate *Myst*.

Tom McDonald has been covering games for countless magazines and newspapers for years. He lives in the New Jersey Pine Barrens.

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Head2Head

A Showdown among natural PC competitors

THIS MONTH: PDA Operating Systems

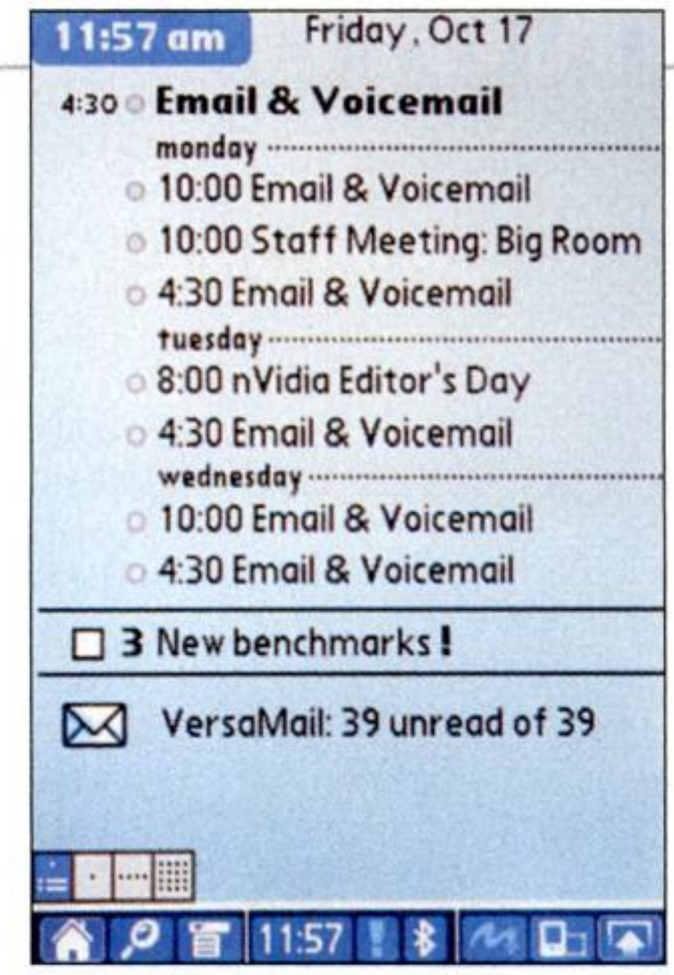
PDA buyers have never been faced with such a confusing platform choice. On one hand, you have Palm OS 5, the latest version of the venerable Palm OS, updated for today's modern PDA hardware. On the other hand, you have Windows Mobile 2003, the newest version of the Pocket PC OS. Microsoft's PDA platform has made great strides of late, and it's now harder than ever to choose between it and the Palm OS. The two operating systems basically do the same things—but in different ways.

Hence this month's toe-to-toedown. We pitted the two contenders against each other in a seven-round brawl, and we're not letting either leave the arena until one emerges a victor. We tested virtually everything you'd ever use in a PDA, from basic features like appointment and contact management to advanced wireless connectivity via Bluetooth, Wi-Fi, and GPRS cellular connections. We pushed each machine to its limit and beyond.

Who's the winner?! Whose OS will reign supreme?!

—WILL SMITH

PALM OS 5



Synchrony: A PDA is worthless if it doesn't talk to your favorite contact management and appointment software, so Palm now provides "conduits" to synchronize both *Palm Desktop* and *Microsoft Outlook* with Palm OS 5 devices. Also included in the OS is *Documents to Go,* which will convert *Word* and *Excel* documents to Palm-friendly formats. We appreciate the gesture, but using its default settings, the included *Outlook* conduit made duplicates of many of our contacts and almost all of our appointments. This is not acceptable behavior. **Winner: Windows Mobile 2003**

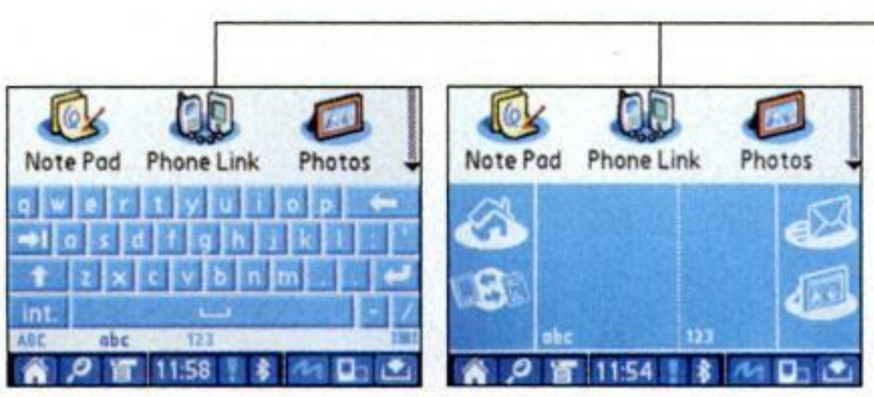
Connectivity: With built-in interfaces that make connecting Wi-Fi and Bluetooth devices seamless, the Palm OS is a strong contender here. However, we haven't seen any Palm devices that actually include support for *both* Wi-Fi and Bluetooth yet, and we hate having to choose one or the other (this is a problem with Palm hardware and not the OS, however). Finally, Palm OS's GPRS configuration tool—which greatly simplifies configuration of the wireless data service included with most GSM cell phones—is so simple, anyone can get it working. **Winner: Palm OS 5**

Hackability: This one's easy. The Palm OS has long supported the Hackmaster line of plug-ins, which let interested parties modify any aspect of the Palm OS interface. This hasn't changed with OS 5. We've seen hacks that allow everything from screengrabs to different ways of sorting your contact list. **Winner: Palm OS 5**

Extras: Finally, the Palm OS includes fancy media apps—an MP3 player, a picture viewer, and a movie player—and has the horsepower to use them. With support for the XScale processor, Palm OS 5 is actually fast enough to play multimedia files. It's a pity that Palm OS 5 lacks a standard media playback software, the RealOne player included with the unit we tested sucks. There aren't any cool DiVX players for Palm OS 5 yet either.
Winner: Windows Mobile 2003

Essential software: Palm has been doing contact-list and calendar management software correctly since the beginning, and the latest version of its OS adds some minor enhancements. For example, tapping a phone number in the contact list automatically dials your Bluetooth phone. Also, the Task list and Calendar programs are integrated with the Contact program, making it easy to find the phone number of the person you just missed an appointment with. Still, there's nothing new here that has us terribly excited. **Winner: Windows Mobile 2003**

Web browsing: The *Web Pro* browser included with the Palm OS 5 PDA we tested is reasonably fast, renders everything properly, and has most of the features we've come to expect in a PDA browser. Heck, you can even flip the screen to landscape mode to render wide web pages without unnecessary scrolling. It's inexcusable to ship a browser designed for a PDA that doesn't disable image rendering. Different hardware ships with different browsers, though. Palm should include a browser with the OS. **Winner: Windows Mobile 2003**



Basic interface: Essential PDA features—such as your contact list, calendar, and notepad—are a single click away. Now, we're annoyed that some frequently used interface elements (specifically the onscreen keyboard and the home menu) aren't big enough to hit reliably without making a concerted effort, but the Palm OS ekes out a win here, simply because its basics are so accessible. **Winner: Palm OS 5**

MAXIMUM PC VERDICT 8

PALMOLIVE

A clean interface and easy access to basic apps are Palm hallmarks.

PALM OIL

The Palm OS isn't taking full advantage of the available hardware yet.

Ships w/hardware, www.palm.com

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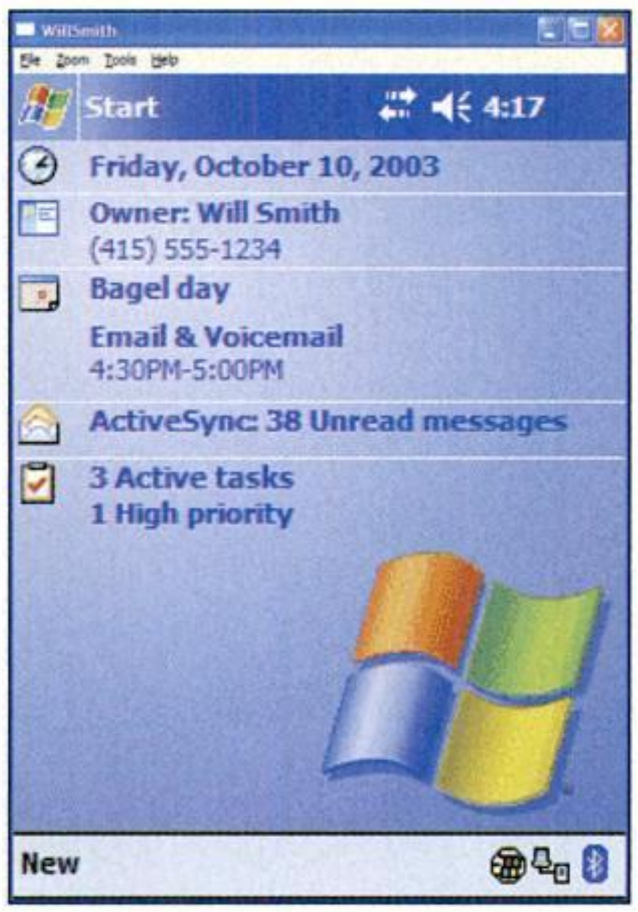
MICROSOFT WINDOWS MOBILE 2003

Synchrony: The Windows Mobile 2003 devices have the upper hand here. For people who intend to sync their PDAs with *Outlook* (read: 95 percent of the PDA crowd), it really doesn't get any easier than *ActiveSync*. Plug it in, set up a relationship, and all the *Outlook* data you want is sucked right into your PDA. **Winner: Windows Mobile 2003**

Connectivity: All the parts are in the right places. Wi-Fi support is great. Connecting Bluetooth devices is easy. But we haven't been able to find an easy way to tell the PDA which connection to use when more than one is available. Ideally, the PDA should connect via Wi-Fi when an access point is available, and use a GPRS-based cellular connection otherwise. Speaking of GPRS, several data providers charge up to $20 for the Pocket PC app that configures your GPRS service, but it's free for Palm OS 5 users. **Winner: Palm OS 5**

Hackability: Although there are loads of cool applications available for the Windows Mobile platform, programmers have a difficult time changing something as seemingly simple as the screen orientation. For a platform so relatively "closed" as Windows Mobile (all Windows Mobile devices even use the same screen resolution!), we'd expect to see loads of cool hardware hacks that work across the spectrum of devices. But there really are none. Microsoft has locked hackers out of that. **Winner: Palm OS 5**

Basic interface: Windows Mobile 2003 is much better than earlier versions of the Pocket PC OS, but we still don't understand why an extremely basic function like the *Notes* app is buried in a menu instead of accessible on the main screen. Yes, the on-screen keyboard and main menu elements are more easily accessed than those on Palm devices, but we still can't forgive the *Notes* faux pas. **Winner: Palm OS 5**



Web browsing: *Pocket Internet Explorer* is the ideal handheld browser. The version that ships with Windows Mobile 2003 drew every page we threw at it—and fast! It even handled web pages that use fancy cascading style sheets and dynamic HTML without any problems (unlike previous versions of the browser). You can easily toggle image downloading on and off, too! Our only gripe is that it doesn't allow landscape browsing. **Winner: Windows Mobile 2003**

Extras: PDAs used to be nothing more than fancy electronic day planners, but with today's speedy 400MHz processors and gads of storage space, they are truly handheld computers. Case in point: Windows Mobile 2003 includes a version of *Windows Media Player 9* that's capable of playing audio and video files. There are also players available for almost every video format that's popular today, including MPEG and DiVX. **Winner: Windows Mobile 2003**

Essential software: The contact-list and calendar are what most people buy a PDA for. It's much easier to find the right contact quickly with the Windows Mobile 2003 contact manager than with the Palm version. By breaking down the alphabet into smaller groups, it's easy to scroll directly to the person whose info you need. **Winner: Windows Mobile 2003**

MAXIMUM PC VERDICT 9

HOT POCKETS

All the basics are covered and the fancy multimedia stuff works great too!

POCKET PROTECTORS

We hate how difficult it is to get to the notepad, but the rest of the package is very compelling.

Ships w/hardware, www.microsoft.com

THE UPSHOT

With the release of Palm OS 5, the PDA gap is smaller than it's ever been before. Both platforms now include native support for modern portable CPUs, more than 64MB of memory, and modern wireless standards like Bluetooth and Wi-Fi. Both platforms have large libraries of software available, from must-have programs like web browsers to goofy toy apps like sun compasses.

What does that mean for PDA buyers? It means that instead of basing your PDA decision on an OS platform, and possibly getting hardware that may not suit your needs, you can buy the PDA with the *hardware configuration* you lust for, and then be confident that you'll have an OS that'll do you right.

The two OSes are mighty close, but Windows Mobile 2003 is holding an ever-so-slight lead, thanks to its tight integration with *Outlook* and the bevy of applications written for its fast processor. We expect to see more apps written to use the new fast Palm CPUs, but they're just not out in force yet. For now, we'll be using HP's iPaq!■

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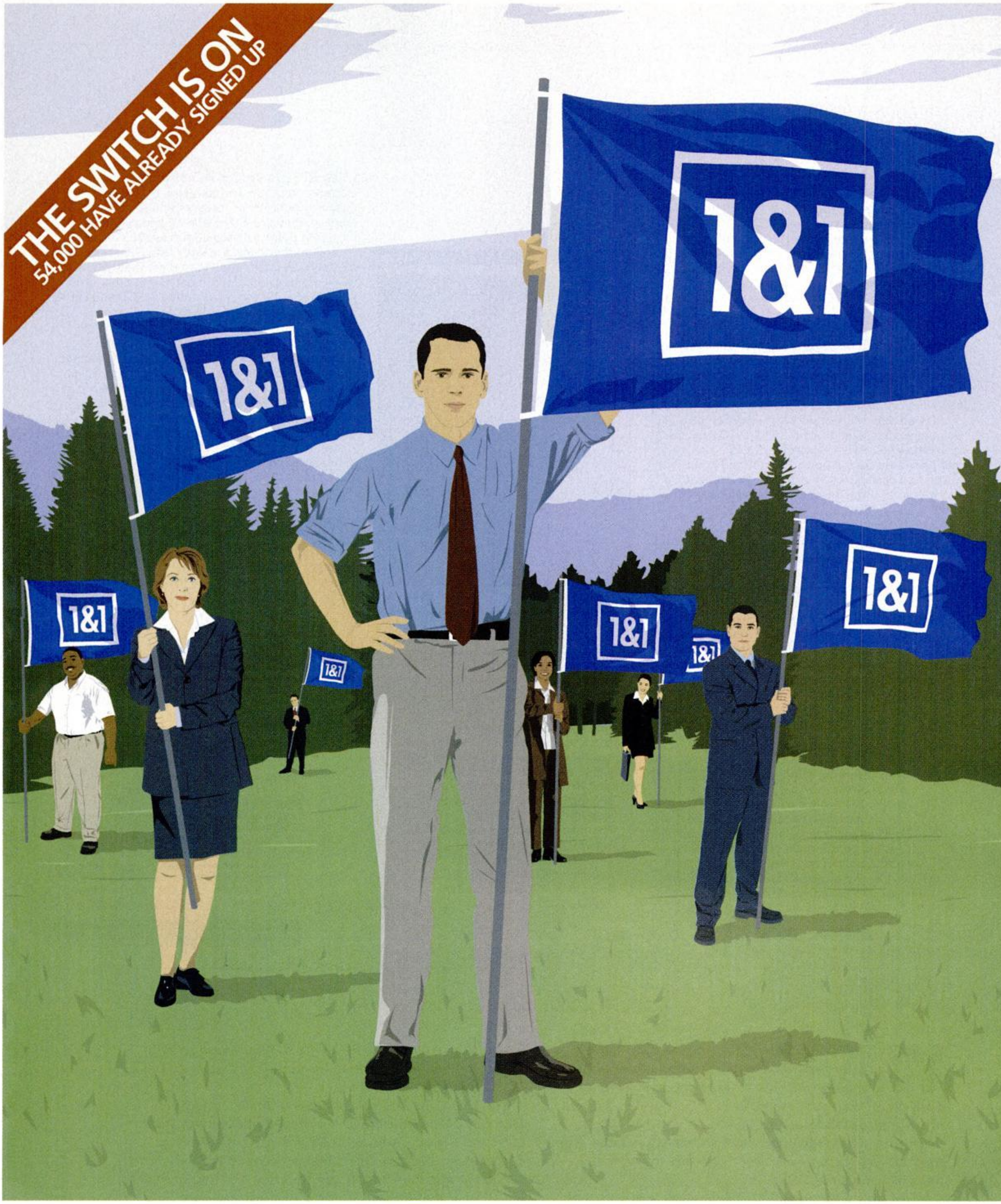

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WatchDog

Say hello to Fred, WatchDog of the Month.

Maximum PC takes a bite out of bad gear

THIS MONTH: The WatchDog goes after...

>IBM >Microsoft >Lexar >ATI

Lawsuit, Anyone?

Another class-action lawsuit has been filed against IBM over the alleged unreliability of its 75GXP Deskstar hard drives. The suit, filed in Texas state court, is similar to lawsuits already pending against IBM. It accuses the company of selling a hard drive with an abysmal failure rate. Although much of the discovery in the case is sealed, a Bloomberg News article revealed a couple interesting allegations:

- Lubricants in the 75GXP hard drives would decompose and solidify on the platters causing potentially fatal errors.
- IBM sold 3.8 million of the hard drives, but says of those, just 180,000 to 190,000 were replaced. (That's far less than what the suits claim.)

Attorneys who filed the suit in Texas declined to comment on the case. Although IBM says the failure rate is nowhere near what the lawsuits allege, 190,000 drives returned to the company would mean that approximately 5 percent may have gone bad. The industry standard for hard drive failure is below 1 percent.

IBM attorneys said during a hearing for the California lawsuit that the 5 percent figure isn't itself accurate as the company doesn't test the drives that are returned, so it doesn't know whether all the drives were in fact defective.

IBM's numbers, however, wouldn't include hard drives that were not returned by frustrated computer users who tired of the replacement drives failing as well. The California court case has been delayed until November, but the Dog will be there covering it. Similar cases handled by the firm Sheller, Ludwig & Badey have been filed in Connecticut, Florida, Illinois, Michigan, New Jersey, New York, Ohio, and Pennsylvania. Woof.

******

Suing IBM over an allegedly defective hard drive that can lose all your data is one thing, but a group of computer users in Los Angeles has filed suit against several computer makers, claiming that hard drive capacities are misrepresented. According to news reports, the suit says Apple, Dell, IBM, Gateway, HP, Sharp, Sony, and Toshiba all sell hard drives that are smaller than their advertised specs. A 100GB hard drive, for instance, actually holds just 93GB of data. The Dog has reported on all kinds of litigation, and this suit strikes him as pretty silly. After all, the computer industry's unique way of defining a gigabyte is common knowledge. Attorneys for plaintiffs Dan Lanchau, Adam Selkowitz, Tim Swan, and John Zahabian refused to speak with the Dog, and it's no wonder: This case sounds like a major waste of time, energy, and money.

A second-front against IBM has opened in Texas, where a consumer has accused the company of selling defective drives.

******

Speaking of lawsuits, Microsoft's long-running antitrust case with the states has drawn to a close, and consumers hurt by the behemoth's alleged monopolistic practices can expect a whopping—*hold onto your seats*—$16 for each copy of Windows or MS-DOS purchased between February 18, 1995 and December 15, 2001. Consumers are also eligible to receive $29 for each copy of *Office*, $5 for each individual copy of *Word* (including versions of *Home Essentials* and *Works Suite*, which shipped with *Word*), and $26 for each copy of *Excel* purchased during the same time period. Now it's up to consumers to either submit a claim form, write to the court to object to the settlement, go to one of the settlement hearings, or do nothing (which would amount to a forfeiture of the vouchers as well as the right to contest the suit or file another suit). Most consumers should have received documents about the settlement, but more information is available at www.microsoft.com/mscorp/legal/class/. State-specific settlement info is also available. Californians should visit www.microsoftcalsettlement.com. Floridians should check out www.microsoftproductssettlement.com/florida/home.htm. And West Virginians should point their browsers to www.microsoftproductssettlement.com/westvirginia/home.htm.

Now back to our regularly scheduled program.

> *"IBM SOLD 3.8 MILLION OF THE HARD DRIVES, BUT SAYS OF THOSE, 180,000 TO 190,000 WERE REPLACED."*

Rated X

DEAR DOG: My new digital camera uses SD card memory. There are two types of SD available: One is your standard SD card memory, and the other is 32x SD card memory, supplied by Lexar Media. While some web sites claim the Lexar card to be faster than the standard SD card, I couldn't find one web site that didn't price the 32x SD card higher. With some confidence, I purchased the 32x Lexar Media SD card. Since then, I learned in conversations with two separate Lexar support guys that there's *no difference* between the speed of the 32x SD cards and the standard SD cards

An x-rated card from Lexar guarantees a certain write speed, while generic cards don't.

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that Lexar carries. How pissed am *I* right now? Is it faster or not? Did the Lexar guys even know what I was asking? Was it just a brilliant marketing scam or what? Help me find the truth in all this madness.

— ROBERT J. STEWART

THE DOG RESPONDS: The Dog spoke to a Lexar representative who said that Robert was given incorrect information, or perhaps something was lost in translation. Lexar says it uses an "x" rating similar to the read- and write-speed ratings of CD-R drives, where one "x" equals 150KB/s. An SD card rated for 32x would guarantee a write speed of 4.8MB/s. SD cards without a rating offer speeds from 2.66MB/s to 4.8MB/s. On non-rated cards, Lexar doesn't guarantee any write speeds, thus one card may be a stellar performer while another could be a dog. It's similar to the way Intel deals with its CPUs: It tests a certain amount of silicon to operate at, say, 3.2GHz. The rest of the chips are then tested to run at 3GHz or 2.8GHz. The chips are then used to make 2.4GHz and 2.6GHz chips. Because the chips are only tested to operate at 2.4GHz or 2.6GHz and not higher, it's quite possible the chips are capable of running at the higher speeds. Usually as the process technology in silicon improves, the speeds also improve. Near the end of the run of the Pentium III CPU, many of the chips coming off the line likely operated at the highest speed but were sold at a lower speed for marketing reasons.

Drivers Kill Monitors?

DEAR DOG: I read in a web site forum that the new ATI driver for the ATI Radeon 9800 cards is killing monitors. I want to install the driver, but I'm worried it'll whack my screen. People are also saying that the new drivers can cause the videocards to *overheat*! Can you please find out what the real story is here?

— JOHN WINGER

THE DOG RESPONDS: The Dog prodded ATI about the alleged problem and received this response: "We have spent a great deal of time trying to reproduce this problem and analyzing our driver code. There is nothing in our driver code that has changed from CAT 3.7 to CAT 3.8 that could possibly cause this behavior. We believe that our drivers are not causing these alleged problems.

"We do not currently believe these stories are valid. We have already confirmed that of the nearly 100 OEM customer programs that have asked for and received this driver, we've received no reports about any such problem. We have also run comprehensive QA tests on the driver before releasing it and have had no cases of failed monitors.

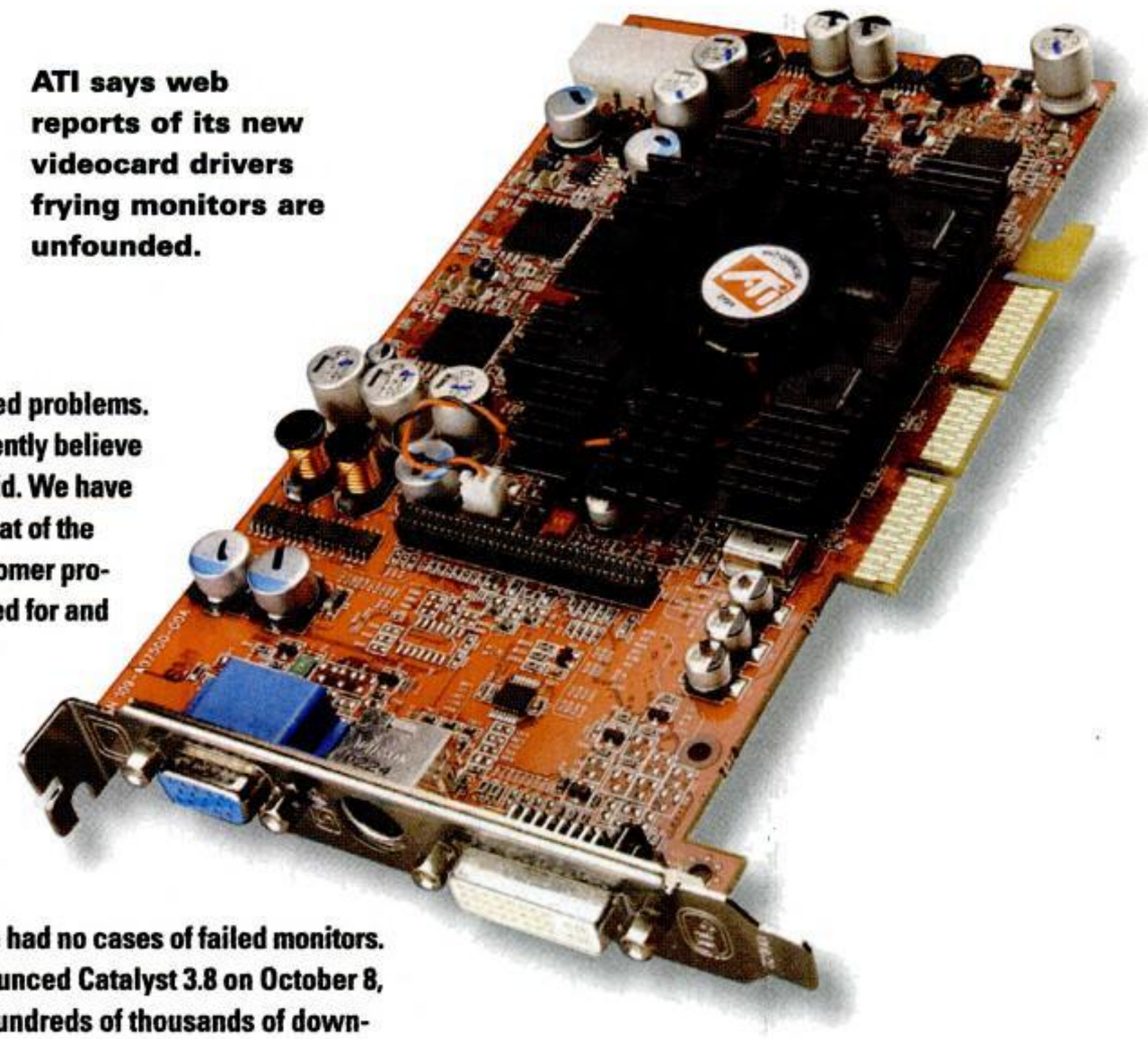
"Since we announced Catalyst 3.8 on October 8, we have recorded hundreds of thousands of downloads, and thus far there have been absolutely no reports whatsoever to ATI's customer-support department regarding failed monitors."

ATI says one of the leading web theories is that the driver, "instead of reading the refresh rates from the primary display INF files, is reading the secondary display INF refresh rates." This problem could cause the monitor to blow out.

But ATI officials refute the theory: "In XP and 2K, we don't have access to monitor INF information in our driver component that manages display capability. We have never used this monitor information for any purpose. We rely on EDID data or user override information to determine monitor capability. Even though the OS may use the monitor information to expose high refresh rates based on monitor INF content, the driver always restricts the actual refresh rate going to the monitor based on EDID or the user override. In essence, the user may be able to select a high refresh rate from an OS-controlled monitor page (under Advanced Properties), but internally the driver will restrict the refresh rate going to the monitor based on EDID information or user override information. If a user sets the override information incorrectly, an incompatible signal would be sent to the monitor.

"In Windows 9X, we can access monitor INF information, but due to issues with how the OS maps the INF to a monitor, we have disabled reading the monitor INF via Registry. Unless someone deliberately changes the Registry setting for this in 9X, they would not run into any monitor INF related issues."

ATI also says that although there is a "slight increase in temperature in certain cases" there's nothing even close to the 50° F increase that some people claim the drivers create. ATI says it's trying to find out why there is a slight temperature increase, but noted that the change is within the operating spec of the card. ■



ATI says web reports of its new videocard drivers frying monitors are unfounded.

"WE HAVE RUN COMPREHENSIVE QA TESTS ON THE DRIVER BEFORE RELEASING IT AND HAVE HAD NO CASES OF FAILED MONITORS."

RECALL ALERT

Segway has voluntarily recalled some 6,000 Human Transporters, which may lose power and cause the rider to fall from the vehicle. Segway says this can happen if the rider speeds up abruptly, encounters an obstacle, or continues to ride after receiving a low-battery alert. Three people were injured after falling from Human Transporters; one required stitches. The recall applies to the i167, e167, and p133 series of Segway Human Transporters.

Segway owners are asked to call Segway at 877.889.9020 between 8 a.m. and 8 p.m. Monday through Friday to receive a software update for the HTs. More information about the recall is available at www.segway.com/support/recalls/recall_001.html or www.cpsc.gov/cpscpub/prerel/prhtml03/03553.html.

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com**. The Dog promises to get to as many letters as possible, but only has four paws to work with.

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BOB AND SPARKY'S PRIME TIME

7:00 pm	7:30 pm	8:00 pm	9:00 pm
Digital Music Download "Yellow Dog Blues"	**TV** Watch last week's "Underdog" marathon	**Digital Photos** Upload Westminster Kennel Club Dog Show Pics & Video	**Web** Surf Kennel Club Web Board
News	**Sitcom**	**Reality Sh**	**Sporting Event**

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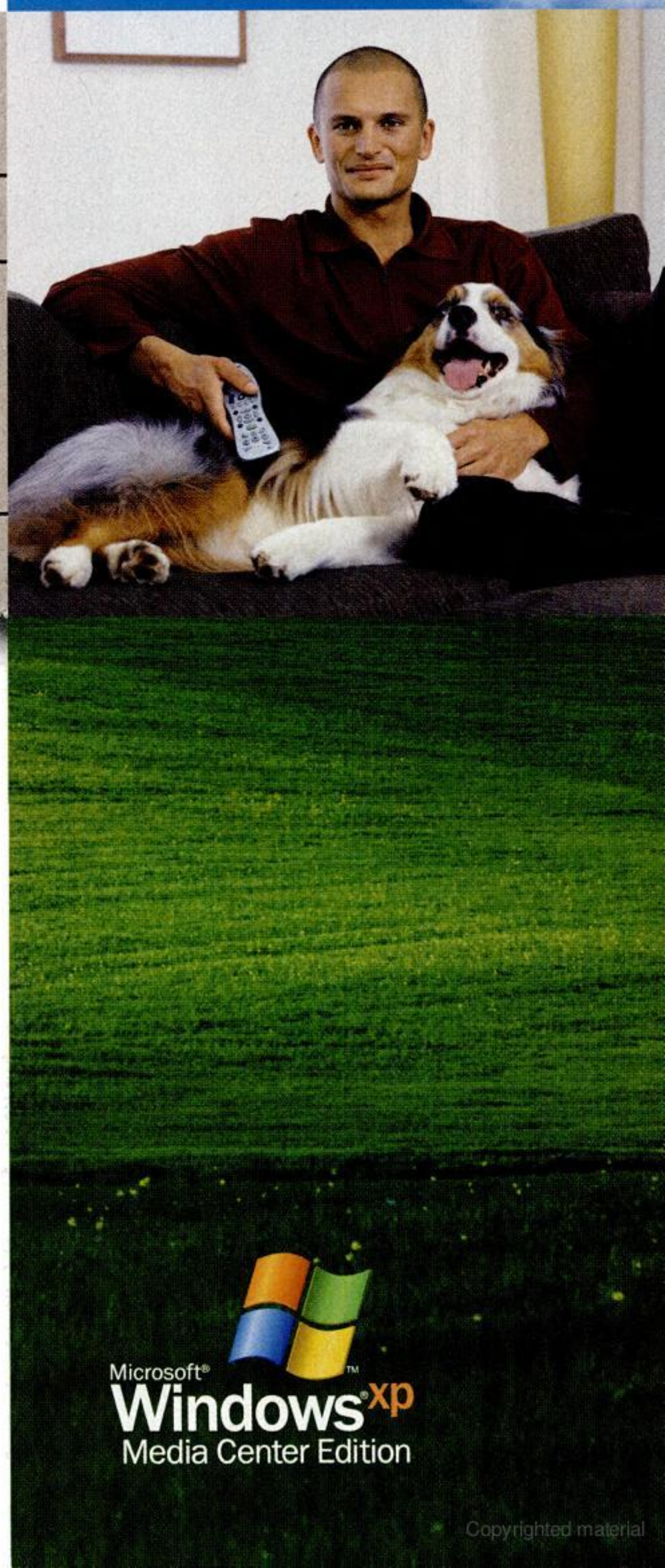

Entertainment that tunes into you.

With a Windows® XP Media Center Edition PC, the programming schedule revolves around you. Pause, rewind, and digitally record your favorite TV shows. Watch your DVDs. Download, upload, and make your own music mixes, videos, and digital slideshows. The Media Center remote control lets you do it all from your favorite spot on the couch. Because it's a full Windows XP-based PC, it can also deliver your e-mail and the Web.* To experience entertainment your way, visit **microsoft.com/mediacenter** or your nearest retail store.

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Gear of the Year 2003

It's the crème de la crème of geek gear. The shiznit of our Lab's biznit. *Maximum PC* is proud to present the best, most essential PC hardware of 2003!

We've seen a lot of eager hardware come through the Maximum PC Lab this past year. Most components come in fresh-faced and smiling, but leave abused, demoralized, and gasping for air. Our benchmarks and testing procedures are rigorous—maybe even cruel—but at the end of the day, if a component can survive our scrutiny, we're confident that it will survive yours, too.

But our Gear of the Year awards are another story entirely. To win GOTY honors, a product that has already risen to the top must compete shoulder-to-shoulder with equally high-performance counterparts. And before we grant GOTY recognition, we take into account not only each component's initial performance at the time when it was first tested, but also its *continued* performance throughout the year as it's been periodically challenged by upstarts.

There are no second or third place "winners" in our list, so don't expect an "I'm OK, you're OK" attitude toward hardware that at one time passed muster in the Lab. Only *one* product in each of our 20 categories receives actual Gear of the Year honors.

We now present the very best hardware of 2003, the hardware no PC power user could possibly live without. Buy it, steal it, try your hand at barter. This gear is simply too special to live without.

Like San Francisco's Transamerica pyramid, the majestic 9800 TX dominates the landscape on which it stands.

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VIDEOCARD

Radeon 9800 XT

There's simply no question about it: ATI's newly minted Radeon 9800 XT is the finest videocard on the planet. But why, you ask, didn't we choose the fastest nVidia 3D accelerator, which benchmarks so closely in comparison? It's simple. The Radeon 9800 XT runs circles around nVidia cards when it comes to DirectX 9 programmable shader effects. We tested both of the currently available DirectX 9 games—*Tomb Raider: Angel of Darkness* and *Halo*—with the Radeon 9800 XT and GeForce FX 5900, and were astounded by the sheer number of visual bugs we saw on the GeForce boards, especially when using nVidia's latest "review" drivers. In comparison, the 9800 XT rendered the effects with acuity.

Based on an enhanced version of the R300 chip that powered the Radeon 9700 and 9800 cards, ATI's 9800 XT features a totally redesigned copper heatsink, as well as built-in, factory-supported overclocking utilities. The Radeon 9800 is aimed squarely at the heart of no-compromises PC power users, and it hits the bull's-eye.

$500, www.ati.com, reviewed on page 100

BEST PENTIUM 4 CORE-LOGIC

See page 36 for the Rock of Gibraltar of all mobo chipsets.

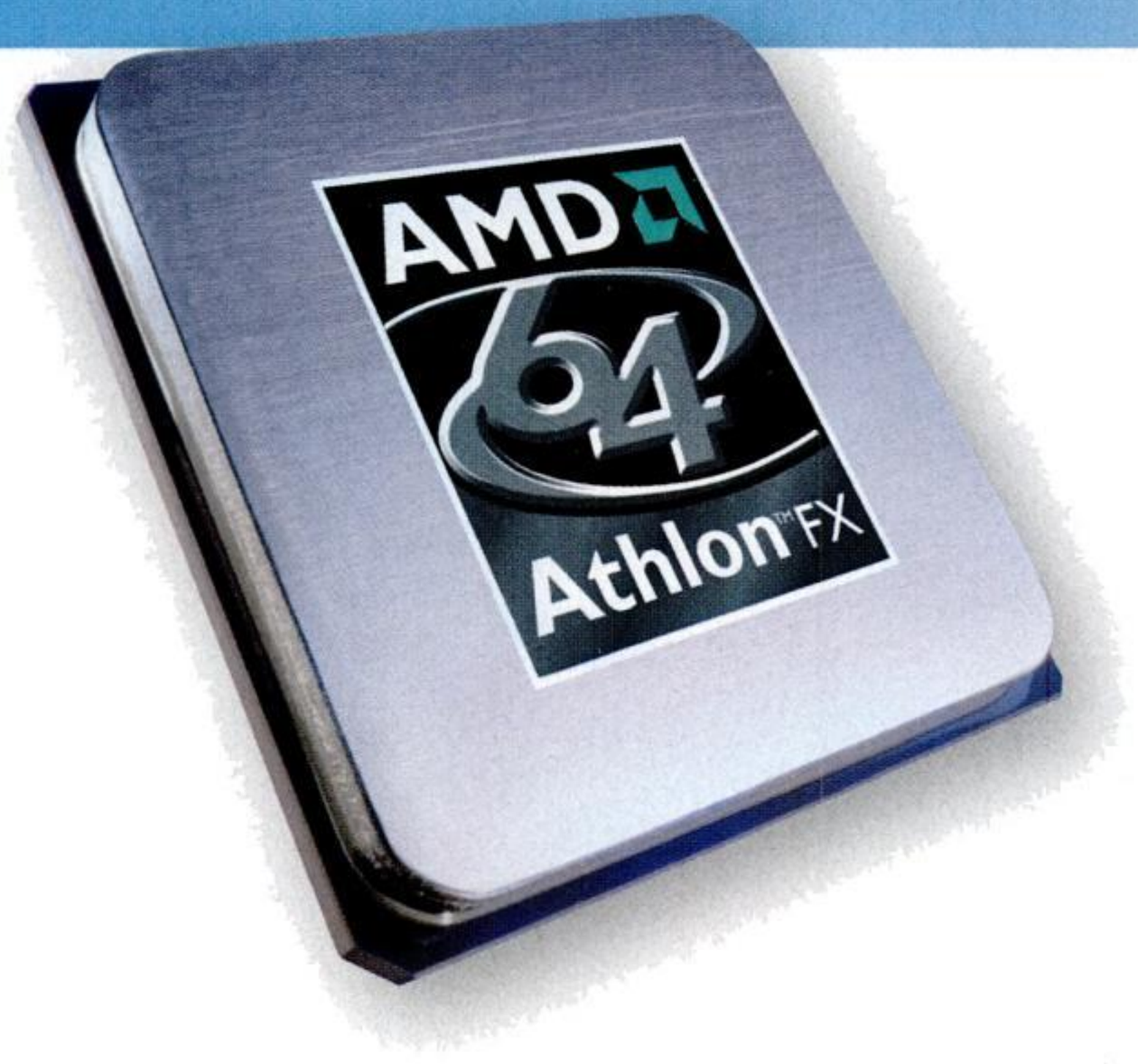
BEST MONITOR

See page 40 for a display that will take your breath away.

GEAR of the YEAR 2003

CPU

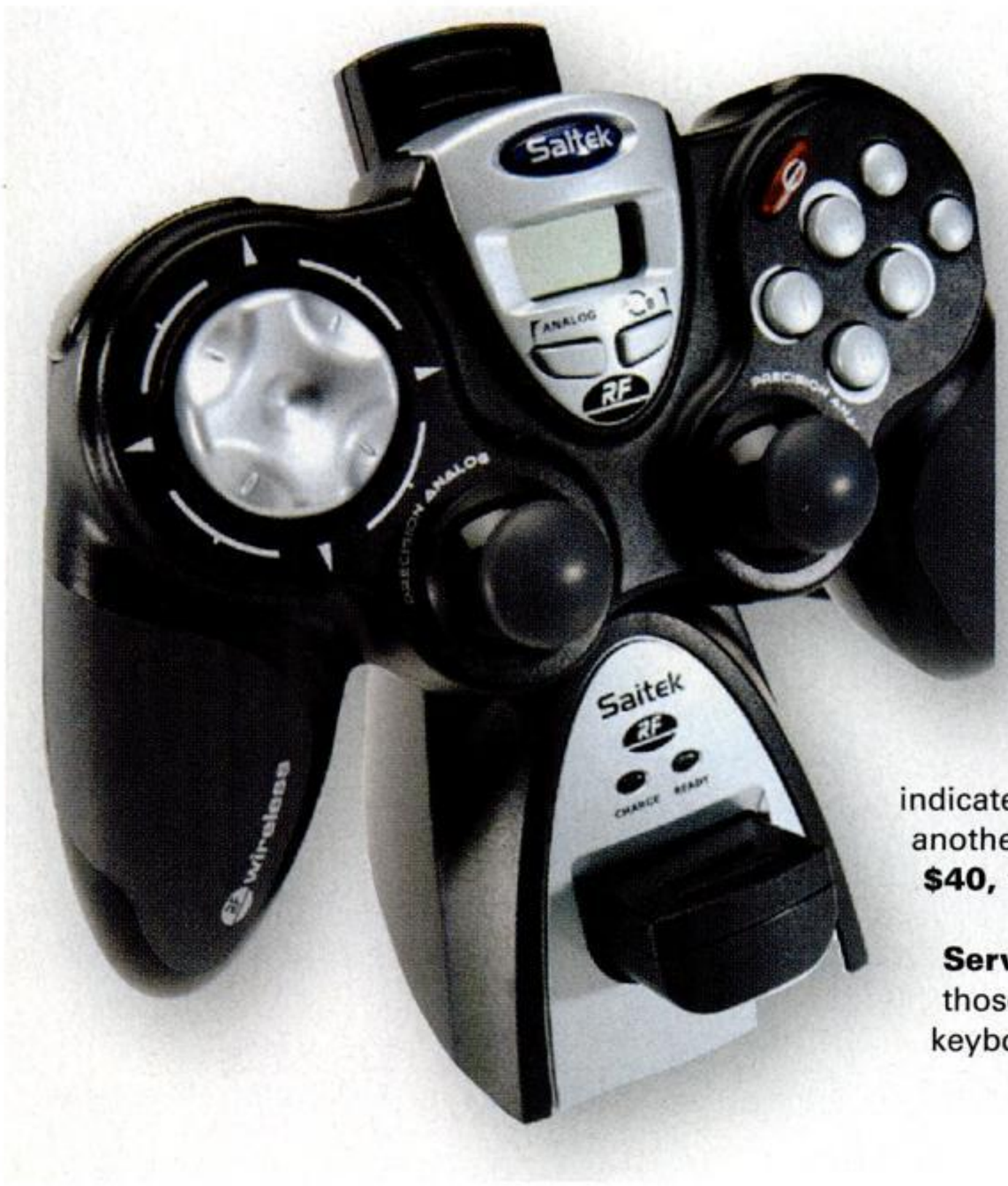
AMD Athlon 64 FX-51



With tricks such as a full-speed, on-die memory controller, 1MB of cache, and forward-looking 64-bit support, AMD has shoved Intel out of the winner's circle with its Athlon 64 series of processors. Last month, we tested the Athlon 64 FX-51 against a 3.2GHz Pentium 4, and found that in areas where the Pentium 4 previously reigned supreme, the Athlon 64 FX is now faster. What's more, early next year when Microsoft introduces its 64-bit version of Windows XP, you'll load that baby on your Athlon 64 FX system, and then rock with 64-bit computing and all the gaudy memory support it has to offer. But perhaps most significantly, we found that the Athlon 64 FX could be purchased at stores a month ago, whereas Intel's latest—the Pentium 4 Extreme Edition—has proved to be little more than vapor (as of press time, at least).

The short story is that the 64 FX offers top-of-the-line performance today, and will let you play with 64-bit computing when your apps and OSes are ready for it tomorrow. AMD made a bold gamble, and it's paying off for power users. **$800, www.amd.com**

Then again: Although extremely difficult to obtain, Intel's Pentium 4 Extreme Edition *does* have its pluses: It beats the FX-51 in some applications, and unlike AMD's latest, it doesn't force users to throw away their current mobos and memory just to upgrade.



GAME CONTROLLER

Saitek P3000 Wireless Gamepad

Eight buttons? *Check*. A pair of analog sticks? *Check*. An eight-way digital pad? *Check*. A pair of triggers? *Check*. All the essentials are present and accounted for. But Saitek had the good grace to make its gamepad wireless, so the next time we fall out of our chairs, we won't be taking our PC down with us. The P3000 connects to its USB base via a 900MHz radio connection, which means it doesn't require line-of-sight to work properly. And the thing that really pushes the P3000 into the stratosphere is a pair of rechargeable batteries. One powers your gamepad, while the other recharges in the bus-powered charging station. So no more *gamus interruptus*. If the power meter indicates you're running on a few spare electrons, just slap in another battery and rock on.

$40, www.saitek.com, reviewed November 2003

Serving suggestion: The best games to use with a gamepad are those ubiquitous console ports. Try playing *Tony Hawk 4* with a keyboard and mouse, and you'll want to gnaw your own hands off.

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SMALL FORMFACTOR BARE-BONES PC

Shuttle XPC SB61G2

We'll be the first to admit that we're Shuttle sluts, but that's because the company that created the small formfactor bare-bones PC continues to prove that experience counts. Shuttle's XPC machines have been—and still are—the best in their class. The XPC SB61GB offers support for 800MHz frontside bus Pentium 4 CPUs, dual-channel DDR, FireWire, and USB 2.0. The enclosures themselves are wonderfully fabricated, and wrenching on the Shuttle is about as good as it gets in a cramped space. Shuttle even offers XPC boxes based on the 875P chipset, as well kits that support Athlon XP and Athlon 64 CPUs. **$350, www.shuttle.com, reviewed October 2003**

Get a handle on the competition: FIC's Ice Cube series seems to be building momentum. You get a plastic exterior instead of aluminum, but there's also a case window, a glowing fan, and that very cool handle built into the top of the enclosure.

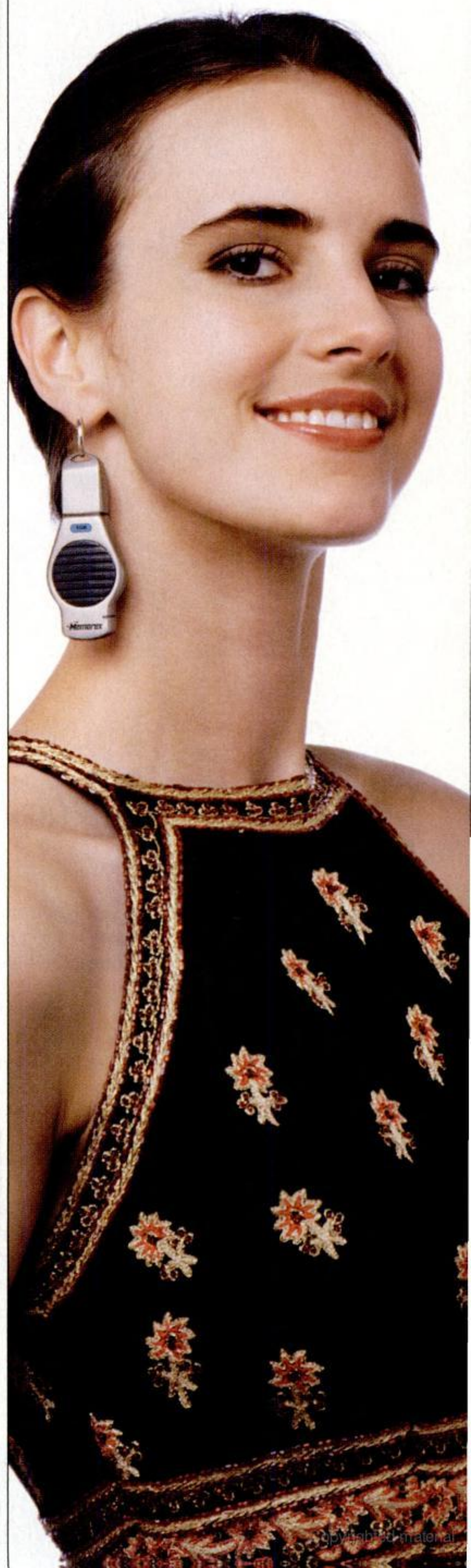
DVD BURNER

Plextor PX-708A

Leave it to Plextor to stand out in a crowd. In this case, it's a very big crowd, indeed, as manufacturers have rushed to capitalize on the DVD-burning frenzy with drives that burn to both major formats (DVD-R/W and DVD+R/W). The PX-708A burns DVDs at an industry-leading 8x, but Plextor went an extra mile by creating an optical drive that can burn at 8x using some types of 4x media! And even when we used media that wasn't on the recommended list, we were still able to burn well above the 4x speed that the discs were rated for. With the lowest access times we've ever seen in a DVD burner, and high-speed CD burning (40x) to boot, Plextor has created the *ultimate* combo drive. What are you waiting for? Go get one. **$280, www.plextor.com, reviewed on page 104**

Sharing is caring: For $360, the Plextor offers the same 8x disc-frying goodness in its external version of the drive, the PX-708UF. And Plextor paired its dual-format burning with, naturally, dual interfaces: FireWire and USB 2.0.

Goes anywhere.



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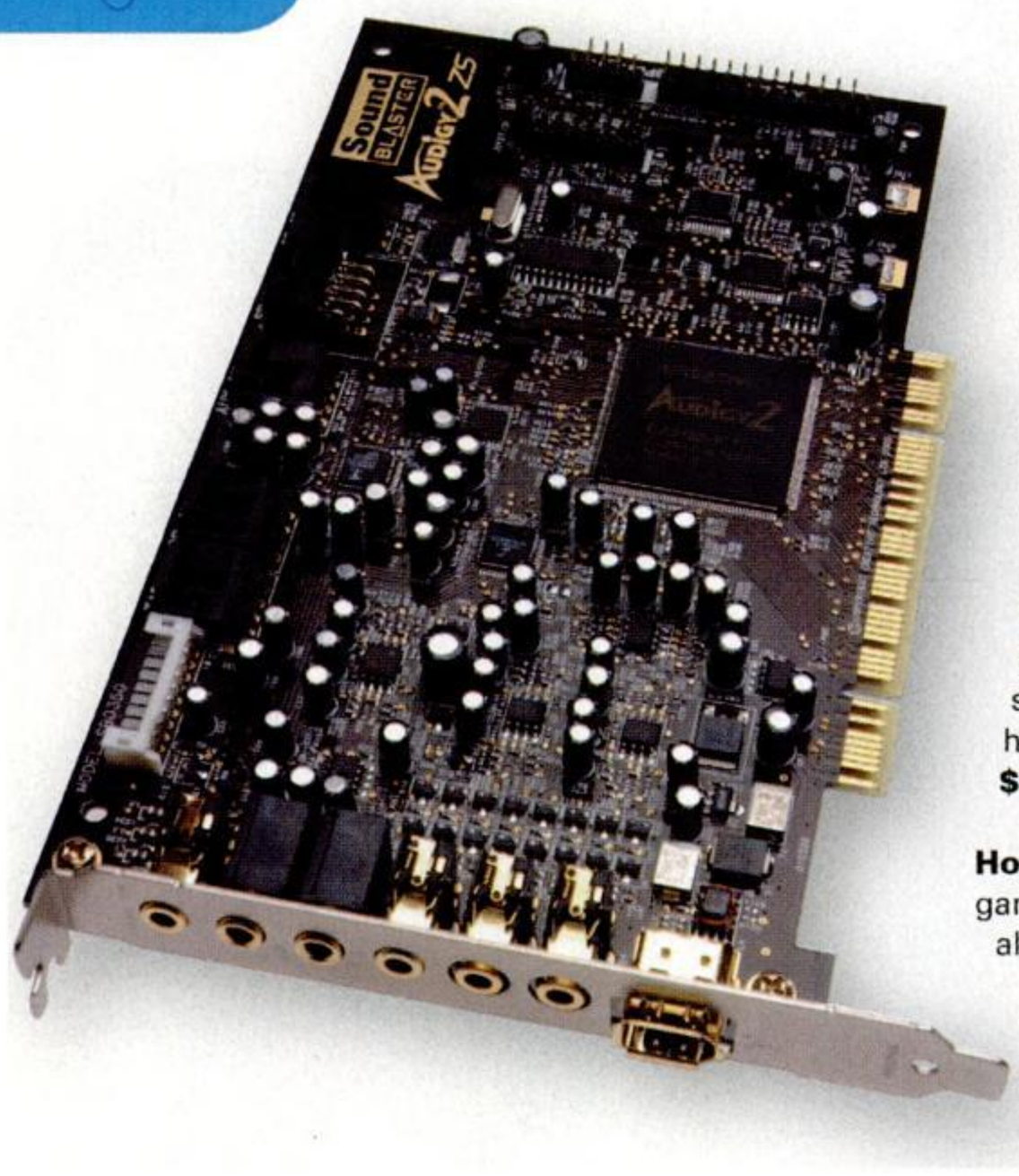
GEAR of the YEAR 2003



SOUNDCARD

Creative Labs Sound Blaster Audigy 2 ZS Platinum

Take last year's soundcard winner, the Sound Blaster Audigy 2, improve its signal-to-noise ratio, and add support for 7.1 speakers, and you've got a new soundcard champ that should do you proper into 2004. But wait, it gets better. The Audigy 2 ZS also lets you listen to DVD-Audio discs—the operative word being "Audio." These new music discs offer 24-bit 192kHz sampling that puts the 16-bit 44.1kHz sampling rate of audio CDs to shame. Like its predecessor, the Audigy 2 ZS is a true audio *accelerator*. Most mobo-bound audio-chip and add-in soundcards ask your CPU to do all the work, but the Audigy 2 ZS hands off many audio processing chores to its own onboard DSP. **$200, www.soundblaster.com**

However: If you don't give a hoot about frame rates in 3D games, you might consider the Revolution 7.1, a superb-sounding alternative to the big A2.

CASE

Cooler Master Wave Master TAC-T01

It's plum criminal how Cooler Master has trimmed down its line of sexy PC enclosures to just a handful of models. Fortunately, however, one of the last survivors is also the best of Cooler Master's breed. The Wave Master TAC-T01 is so lovely, in fact, we used it for this year's Dream Machine. The TAC-T01 comes with a snazzy blue LED light that illuminates the front bezel, as well as a top-mounted cluster of audio I/O and USB ports. (We're beginning to think such top-mounted clusters should become an industry standard.) The TAC-T01 isn't as big as some of the other Cooler Master cases that reside in our case hall of fame, but these days, bigger *isn't* better. With everybody intent on shrinking cases to the size of a pimento loaf, the Wave Master strikes a good compromise between huge and diminutive without completely compromising expansion. **$158, www.coolermaster.com**

Yeah, but: In some cases, extra steel is useful. Antec's PlusView 1000AMG gives you a case window and room for 10 drives. Yes, 10 drives, count 'em. It also has front USB ports and a washable air filter, all for just $99.

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PDA

Hewlett-Packard iPaq 5555

Once an all-Palm OS shop, the Maximum PC Lab now has four editors who've made the switch to Pocket PC—and HP's decadent, featurific iPaq 5555 proved to be the deciding factor for more than one fence-hopper. With a user-replaceable battery, 400MHz XScale CPU, and onboard Wi-Fi and Bluetooth (that's right, *both*), this iPaq can't be beat for speed or features. And did we mention that the iPaq runs Windows Mobile 2003, and comes with a fingerprint scanner as well as a whopping 128MB of RAM? It's no wonder the 5555 is such a Pied Piper for the Pocket PC platform. **$650, www.hp.com**

Nonetheless: Palm's Tungsten C has a bigger battery, so you can use its built-in Wi-Fi all day. The same can't be said for the iPaq.

ATHLON XP CORE LOGIC

nVidia nForce2 Ultra 400

If you plan on building an Athlon XP system, there's only one sane chipset choice: nVidia's nForce2 Ultra 400. It's fast, stable, stuffed to the gills with features, and still offers the only onboard audio worth a darn. Dual NIC support, a rock-solid driver set, and dual-channel DDR support (dual-channel support that other Athlon XP chipsets *lack*) only seal the deal, and make the nForce2 an untouchable mobo-bound monster. Considering that nVidia failed to put Dolby Digital real-time encoding into the nForce3, the nForce2 becomes the natural candidate for early entry into the chipset hall of fame. **Prices vary depending on motherboard costs, www.nvidia.com**

Um, what about Athlon 64?: It's no secret that we think the Athlon 64 FX is a better processor than the Athlon XP, but we're not quite ready to name an 64 FX chipset as Gear of the Year. We haven't had time to properly torture-test the breed, and we expect that not all contenders have yet reached market. Stay tuned.

Carries anything.

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GEAR of the YEAR 2003

SPEAKER
Logitech Z-680

Making a second straight appearance on our GOTY list, the six-piece Logitech Z-680 set continues to deliver the punchiest PC sound and the best all-around feature set for PC speakers. What's kept our attention all these months is the set's unique audio personality, which is tilted unmistakably toward the gamer. The satellites' tweeter-less design sacrifices perfect high-end response in favor of powerful, lively mids and an absolutely butter-smooth crossover. And instead of a fancy side- or down-firing sub, Logitech again took the brute-force approach. A single front-firing 8-inch woofer drives the Z-680's ladylike sub. Why ladylike? Because no matter how much air it pushes, this subwoofer doesn't belch! The practical upshot is that these speakers get loud enough to blow your clothes off. Rockets rumble, bullets whiz, and explosions rattle your window panes.

The wide assortment of connector options is the icing on the Z-680 cake. With coax digital, optical digital, and 5.1 analog connectors, the Z-680s are equipped for any audio connection option. The wireless remote, and Dolby Digital 5.1 and DTS decoders even make the Z-680s perfect for watching DVD movies as well. **$400, www.logitech.com, reviewed December 2002**

Oh so close behind: The Klipsch ProMedia 5.1 Ultras offer more accurate sound reproduction at the same price. But the Klipschies don't offer digital 5.1 inputs, and lack Dolby Digital 5.1 and DTS decoders, and a remote control. Plus, we just plain prefer Logitech's larger-than-life approach.

You may want to tape your windows and put away your glassware before trying out the Logitech Z-680s at full bore.

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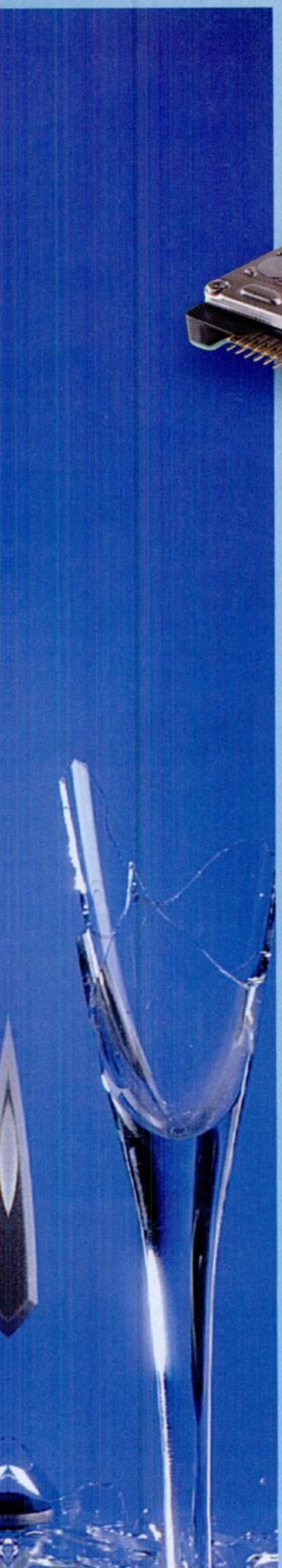


WILDCARD

Hitachi Travelstar 7K60

Sometimes we come across a product that absolutely must be recognized in our GOTY compendium, but doesn't quite fit a well-defined category. This year that product is the Hitachi Travelstar 7K60. Do your notebook a favor, and replace that old 5400rpm drive with the first ever 7200rpm drive in 2.5-inch trim for portables. The secret sauce in the 7K60 is a miniaturized slider apparatus (i.e., the tiny wing that supports the read/write heads as they hover above a hard disk). Hitachi's "Femto Slider" is three times smaller than that of other notebook drives, resulting in reduced power consumption, improved shock resistance, and the ability to detect even smaller magnetic particles on the drive platter. That's how Hitachi achieved an areal density of 50Gbits per square inch, and a capacity of 60GB in one sweet baseball card–size unit. The performance difference? We clocked a 55 percent improvement over Hitachi's 5400rpm 2.5-inch drive!

Nothing hobbles a notebook's performance like a slow hard drive. Our kudos go to Hitachi for taking a ho-hum weak link, and turning it into an object of high-performance geek desire. **$265, www.hgst.com**

Do a double take: Before you slap down cash for the 7K60, make sure your notebook accepts 2.5-inch drives. Some portables accept only 1.8-inch drives.

Fits everyone.

GEAR of the YEAR 2003

CD BURNER

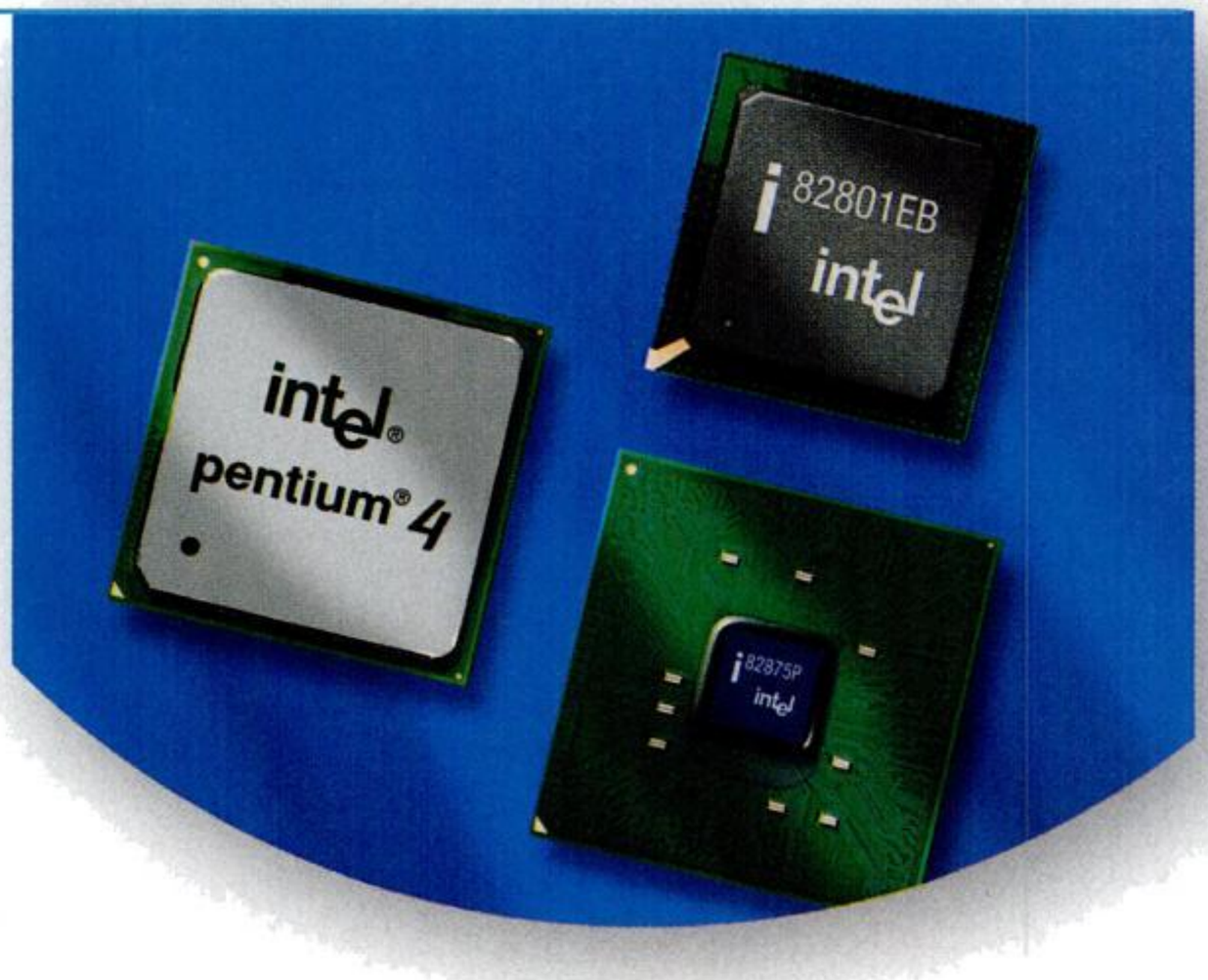
Plextor PlexWriter Premium

Plextor *could* have released a bread-and-butter 52x CD burner just to satiate the appetites of those who simply must have the fastest drive possible. Plextor *could* have kicked back, crowing about 52x burning to CD-R, and 32x burning to CD-RW. And yes, the company *could* have bragged about the PlexWriter Premium having the lowest access times of any optical drive we've tested, as well as super-finicky digital audio extraction. But Plextor's engineers didn't stop there. For its PlexWriter Premium, Plextor went all out with so many extra features, the drive oughta be called the Swiss Army Burner. For example: "GigaRec" allows you to back up just less than 1GB on a classic 700MB disc, while "SilentMode" allows you to tweak the drive to your individual tastes—drive speeds can be throttled down for quieter operation, or cranked up for maximum performance. The PlexWriter Premium is an embarrassment of riches, but one we're not embarrassed to endorse. ***$116, www.plextor.com, reviewed July 2003***

You can't say no: Don't turn down an offer for a free upgrade! Check your manufacturer's web site at least twice a year for firmware upgrades that increase media compatibility and notch up performance.

PENTIUM 4 CORE LOGIC

Intel 875P



Code-named "Canterwood," Intel's 875P was the first P4 chipset to offer native Serial ATA support, an 800MHz bus, dual-channel DDR400 support, and a special northbridge pathway to increase gigabit Ethernet speed. And if you buy a mobo with the 875P's ICH-5R southbridge I/O controller, you get built-in RAID 0 support.

So why not buy a chipset from VIA, ATI, or even SIS, whose new product offers support for *quad*-channel RDRAM? Quite frankly, it comes down to performance. VIA's PT800 only supports single-channel DDR. The Pentium 4 is starved without massive infusions of bandwidth, which no single-channel DDR chipset can deliver. As for ATI, its Pentium 4 chipset is aimed at the low-end. And, finally, while we haven't tested the SIS chipset yet (it won't be out until the very end of the year), we know that RDRAM's days are numbered. You'll be able to use your supply of PC800 RDRAM with the new SIS chipset, but it's looking like it won't outperform the 875P by very much, if at all.

When you factor in Intel's ability to deliver no-excuses drivers, you've got *the* chipset to carry you into the middle of next year, which is when PCI Express will hit the scene. **Prices vary depending on motherboard costs, www.intel.com**

You didn't hear it from us: Some mobo manufacturers are selling Intel 865PE-based boards that include "enhancements" that help the 865PE achieve 875P-like performance. Check out products from Asus, MSI, and Gigabyte.

BUDGET VIDEOCARD

ATI Radeon 9600 Pro

We realize that not everyone has $500 to shell out for a top-shelf 3D accelerator. That's why we're so happy—nay, *delighted*—to see a full-featured videocard that's just a tad slower than the top dog, and it's available for less than half the cost! The Radeon 9600 Pro is that do-gooder budget card. The secret to the 9600's low cost and great performance is its core. It's basically the same core that's present in the Radeon 9700 and 9800, but has fewer programmable shader units and fewer pixel pipelines. This limits the 9600's performance, without limiting its functionality. It's a fully DirectX 9-compatible part, and is fast enough to run the DirectX 9 games we've tested with all their fancy programmable shaders turned on. **$200, www.ati.com, reviewed June 2003**

Caveat emptor: If you don't use "3D applications" (read: games), then you don't need a fancy 3D card. In that case, just go to your local computer swap meet and pick up the cheapest AGP card you can find.

MOUSE

Logitech MX700

We waited a *looong* time to finally see the first great wireless gaming mouse, the MX700 from Logitech. It's been more than a year since that initial sighting, and we *still* haven't seen another wireless mouse that we'd trust our virtual lives to in a deathmatch. The MX700's high-res 800dpi sensor gives us the speed and accuracy we require to liberate our opponents from the burden of their less-than-l33t lives, all without the hassle of tugs on the mouse cord. Of course, the MX700 isn't just for twitchy gamers. The comfortable grip of Logitech's foxy little rodent fares well during everyday use, and the MX700 merrily recharges its batteries whenever it's seated in its base station. **$80, www.logitech.com, reviewed November 2002**

Leash laws: Wireless mice are inevitably more expensive than their non-wireless brethren. You can get all the accuracy and comfort of the MX700 in Logitech's corded MX500—for $30 less.

Introducing the Memorex ThumbDrive.

A whole new way to carry your files.

Whether you're looking for performance or style, the Memorex ThumbDrive® wins hands down. Incredibly small and durable, this beautifully sculpted drive represents the very best of Flash technology. With capacities ranging from 128MB to 1GB, it transfers tons of photos, music or data at rates up to 50% faster* than competitive USB™ 2.0 products. And the USB connection means it's compatible with both PC and Macintosh®, as well as many portable electronic devices. The go-anywhere, carry-anything, sleekly-styled ThumbDrive from Memorex—this thumb deserves a hand.

Memorex®

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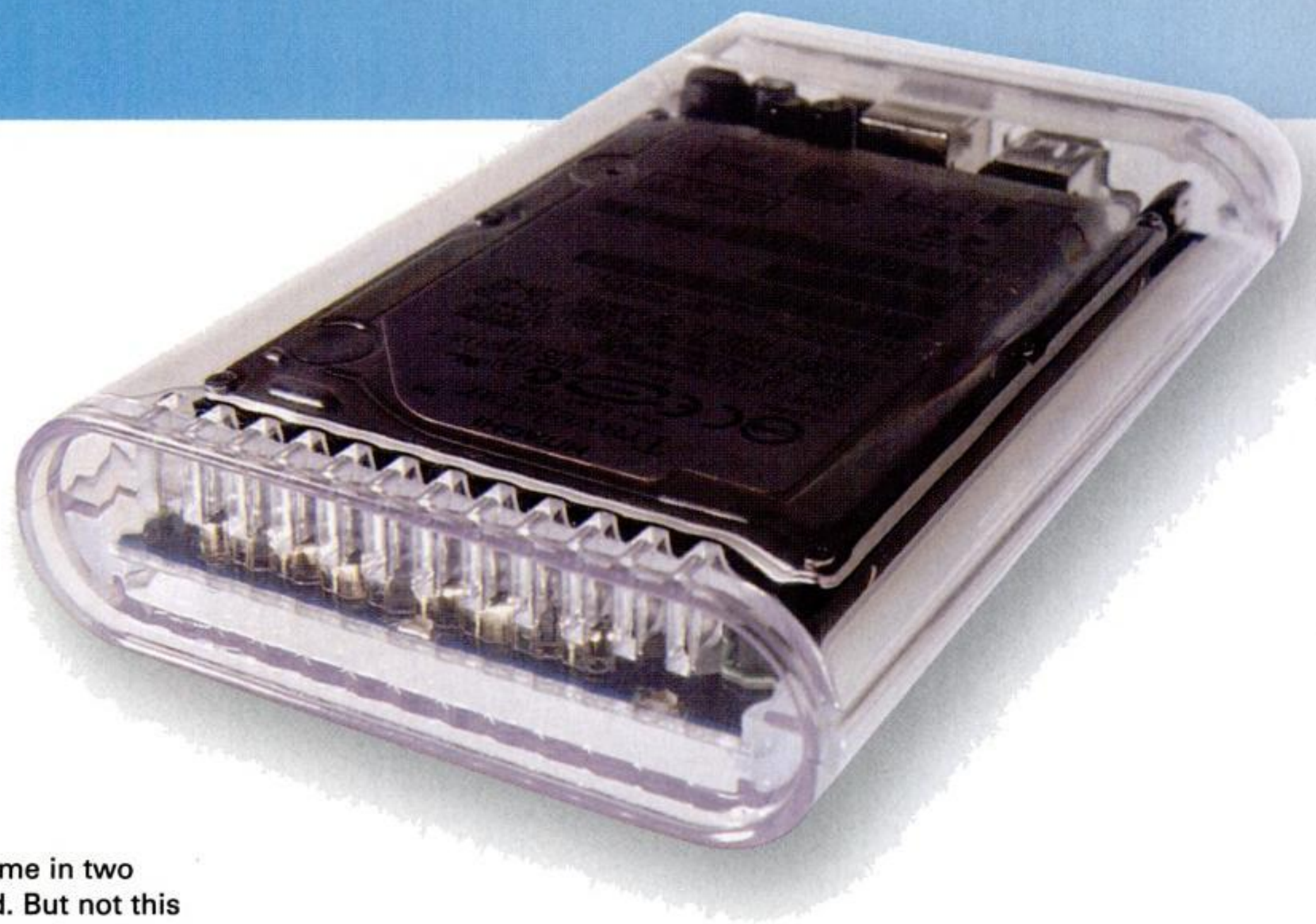
GEAR of the YEAR 2003



EXTERNAL STORAGE

Mercury On-The-Go 60GB

External hard drives traditionally come in two flavors—oversized or underpowered. But not this season. With the arrival of the Mercury On-The-Go, we no longer have to give up speed for size (or vice versa), as the "Merc" delivers a blazing 7200rpm spindle speed and a whopping 60GB of storage in a sexy, transparent package that fits in a pocket. It's even got an 8MB cache, which helps the Mercury roast all other portable drives like a pack of unlucky seagulls flying through its afterburners. It's bus-powered. It supports four-pin and six-pin FireWire *as well as* USB 2.0 and 1.1. It's got a cool blue L.E.D. We could go on and on, but you get the idea. **$400, www.macsales.com, reviewed November 2003**

Sometimes smaller is better: M-Systems' high-capacity USB 2.0 DiskOnKey offers 1GB in a dongle the size of a big fat pinky.

MP3 PLAYER

Apple iPod

We've seen oodles of MP3 players strut through the Lab wearing the skimpiest of bathing suits, but once again Apple's iPod ends up with the tiara and roses while other contestants have no choice but to smile graciously. With a slimmer design, touch-sensitive controls, and a cool docking station, Apple managed to make this third-generation model even sexier and easier to use than last year's contestant. But it's not just about the hardware. Unlike many other MP3 players, the iPod appears as a removable disk in Windows Explorer, so you don't need special software to load data files onto its humungous 40GB drive. You can even create playlists on the fly with the scroll wheel and the touch of a single button. Borrow a friend's iPod for a week and you'll agree: No one can take a bite out of this Apple. **$500, www.apple.com, 30GB model reviewed September 2003**

Upgrade your audio: Before buying any MP3 player, factor in the price of buying *separately* the best headphones or earbuds you can afford. *No other single thing* will improve your listening experience more.

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Computer Components | Computer Systems | Office Supplies | Consumer Electronics | Software

Intel Pentium 4 CPU
3.0 GHz 800MHz
Part#: 3.0_800BX

Sony Cyber-Shot DSCP8
3.2 MP Digital Camera
Part#: SO_DSC-P8

Western Digital 250 GB
ATA100 Hard Drive
Part#: HD-W2500BB

Sony CLIE NX73V
Handheld PC
Part#: SONY-NX73V

AMD 64 3200+ CPU
Processor
Part#: A64-3200BX

iPAQ h1935
Pocket PC
Part#: SYN-980410

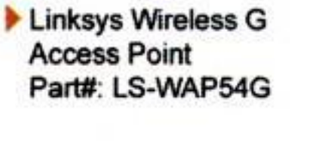
SuperTalent USB 2.0 512MB
Flash Memory Pen Drive
Part#: USB2.0-512

D-Link AirPlus Enhanced
2.4GHz Wireless Router
Part#: DL-DI714P

MSI K8T Neo-FIS2R Socket
754/Athlon 64 Motherboard
Part#: MB-K8TNEO

Kingston 256MB
DDR400HyperX Memory
Part#: D400HX256K

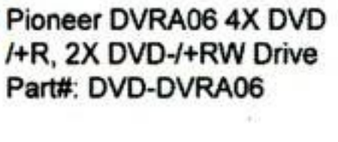
Hey, check this out!
eWiz has everything you need.



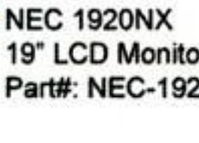
Linksys Wireless G
Access Point
Part#: LS-WAP54G

Olympus xD-512MB
Picture Card
Part#: P-XD-512MB

Maxtor 80GB
Ultra ATA133 Hard Drive
Part#: HD-MX80A7Y



Pioneer DVRA06 4X DVD
/+R, 2X DVD-/+RW Drive
Part#: DVD-DVRA06



NEC 1920NX
19" LCD Monitor
Part#: NEC-1920NX

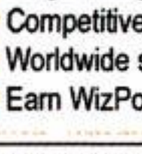
Netgear WG602 54Mbps
Wireless Access Point
Part#: NET-WG602

Sound Blaster Audigy 2 ZS
Platinum
Part#: SC-0360PE

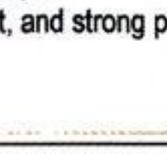
Abit IC7 Max 3 P4/875P
ATX Motherboard
Part#: MB-IC7MAX3

Nikon Coolpix 3100
3.2 MP Digital Camera
Part#: NIKCPX3100

Shuttle SB65G2 Barebone
PC w/ Wireless LAN
Part#: MB-SB62G2

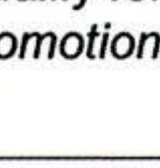


Verbatim DVD + RW
Re-writable Disc, 4.7GB
Part#: VER94240



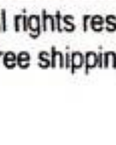
Pendaflex Recycled
Assorted Color File Folders
Part#: ESS84370

Quicken
Deluxe 2004
Part#: 278849

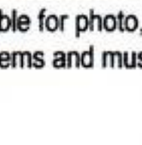


Logitech Cordless
Trackman Mouse
Part#: MO-MARBLE3

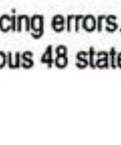
Kodak EasyShare DX6440
4.0 MP Digital Camera
Part#: KOD-DX6440



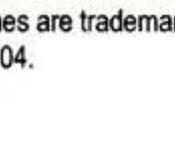
Avery Durable View
Binder, White
Part#: AVE17012



TDK CD-Recordable Discs
52 x 10pk
Part#: TDK48208



Symantec Norton
Antivirus 2004
Part#: 10097935



ATI Radeon 9800 Pro
128MB AGP Video Card
Part#: AT-98PRO_R

Canon Powershot G5
5.0 MP Digital Camera
Part#: CANON-PWG5

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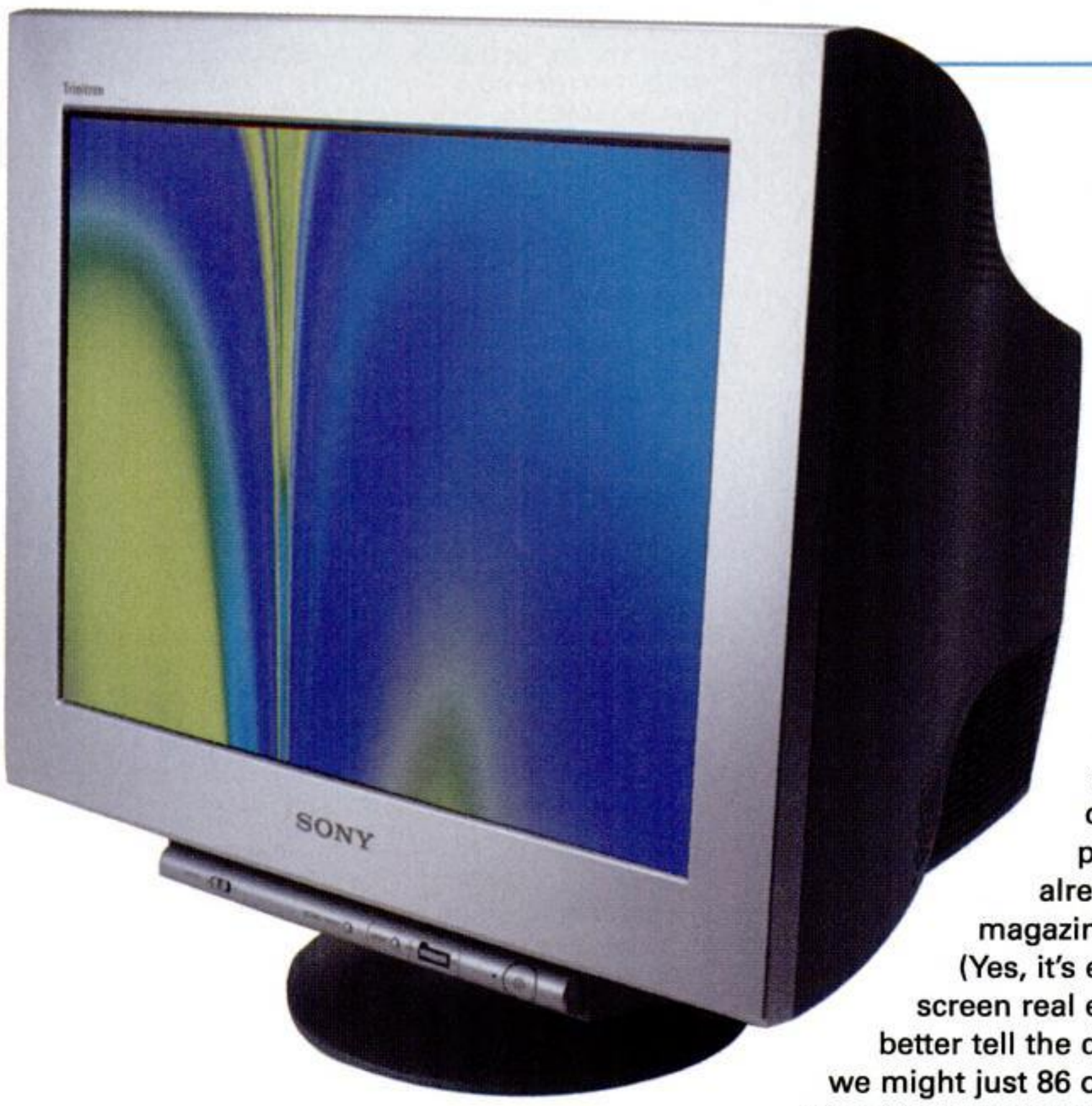
HARD DRIVE

Western Digital 360GD Raptor

Waiting for ATA hard drives to make the leap from 7200rpm to 10,000rpm spindle speeds was a lot like watching a glacier advance, except not quite as action-packed. And then came the Raptor. Not only does Western Digital's 360GD represent the dawning of a new generation of hard drive technology, it also kicks the gazpacho out of every other ATA drive on the market. Whether we're talking seek times, reads, writes, IOs, IOUs, you name it, the Raptor attacks 7200rpm drives like its Jurassic forbearers. Even better, Western Digital should have already released a 74GB version by the time you read this. Chomp! **$190, www.wdc.com, reviewed May 2003**

If size matters that much: If you simply must have just one drive for all your data, the Raptor's paltry 36GB capacity won't cut it, so we recommend Western Digital's fast and roomy 250GB 2500JB for people who need more space.



MONITOR

Sony F520

Yadda, yadda, yadda. Yadda, yadda, yadda. Yadda, yadda, yadda. (Throat clearing.) Yadda, yadda, yadda.

Get the picture?! Hear what we're saying?! Do you understand the words that are coming out of our mouths?! The F520's dominance in the desktop display space has continued for so damn long, we just can't bring ourselves to detail in print the CRT's amazing specs and features anymore, *nor* can we even bring ourselves to describe all the accolades we've given it in the past. If you're a regular reader of *Maximum PC*, you already know the whole story. If you're new to our magazine, just trust us: This CRT is hands-down the best. (Yes, it's even better than Sony's FW9000, which offers more screen real estate but less exacting pixel detail.) Someone better tell the display industry to engineer a better CRT, or... or... we might just 86 our *entire* Gear of the Year list next time around!
$1,600, www.sonystyle.com

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Lighten Up.

It wasn't so long ago that if you wanted to bring your data with you, your hardware had to come too. Well, that's all in the past now thanks to the new SanDisk Cruzer™ Mini. At under half an ounce, the Cruzer Mini goes anywhere, and with up to 256MB of flash memory, it takes a lot with it. Hi-speed USB 2.0 compliant, SanDisk's Cruzer Mini lets you transfer data faster than ever before. And at less than 8mm thick, all it needs is a single USB slot. Just drag, drop, and go. It's all about convenience – no extra hardware, no worries.

So whether you're installing utilities or updating print drivers for the umpteenth time, you can take your files with you wherever you go – and you won't even need your dolly.

For more information on SanDisk Cruzer Mini, visit www.sandisk.com/maximum

HI-SPEED USB 2.0

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GEAR of the YEAR 2003

NOTEBOOK
Voodoo Envy M460

Voodoo's mean mother of a portable casts a spell on all who pray at its pure-power altar.

In fighting games, it's not enough to merely beat your opponent unconscious. Oh no, you have to really humiliate him with an elaborate finishing move. Voodoo Computers applies this satisfying strategy in its aptly named Envy M460. Part one of the KO is delivered with ATI's Radeon Mobility 9600, a full DirectX 9 part that effortlessly schools graphics chips from other companies. And then Voodoo closes in with a deadly finishing blow in the form of Hitachi's new 7200rpm hard drive. Hard drives in notebooks have been a bottleneck for years, so we're overjoyed to see a real breakthrough. The notebook itself features a 2.6GHz Pentium 4M chip, which offers good performance without killing the battery. Go ahead, says Voodoo, bring it on. **$3,515 as tested, www.voodoopc.com**

The counterpunch: With its hamster-powered Transmeta 5800 CPU, Fujitsu's P2120 is the exact opposite of the Voodoo. However, massive battery life in a tiny notebook with a DVD-ROM/CD-RW combo drive makes it one damned useful machine for folks who have real machines to fall back on. ■

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OXM	9.4
EGM	9.5
Game Informer	9.5
GMR	10
IGN	9.5

STAR WARS
KNIGHTS
OF THE
OLD REPUBLIC™

THE HIGHEST RANKING RPG OF THE YEAR IS NOW AVAILABLE ON PC.*

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There is no emotion, there is peace.
There is no ignorance, there is knowledge.
There is no passion, there is serenity.
There is no death, there is only the Force.
Jedi are guardians of peace in the galaxy.
Jedi use their powers to defend and protect,
never to attack others.
Jedi respect all life, in any form.
Jedi serve others rather than ruling over
them, for the good of the galaxy.
Jedi seek to improve themselves through
knowledge and training.

CHOOSE YOUR PATH

It is four thousand years before the Galactic Empire. Thousands of Jedi and Sith are fighting an epic battle between light and dark with you at the epicenter and the fate of the galaxy hanging in the balance. You can side with the light or succumb to the darkness–but in the end you must choose and let the galaxy suffer the consequences.

THE HIGHEST RANKING RPG OF THE YEAR IS NOW AVAILABLE ON PC.*

TEEN T Violence ESRB CONTENT RATING www.esrb.org

PC CD-ROM SOFTWARE

XBOX

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CREATIVE EAX ADVANCED HD

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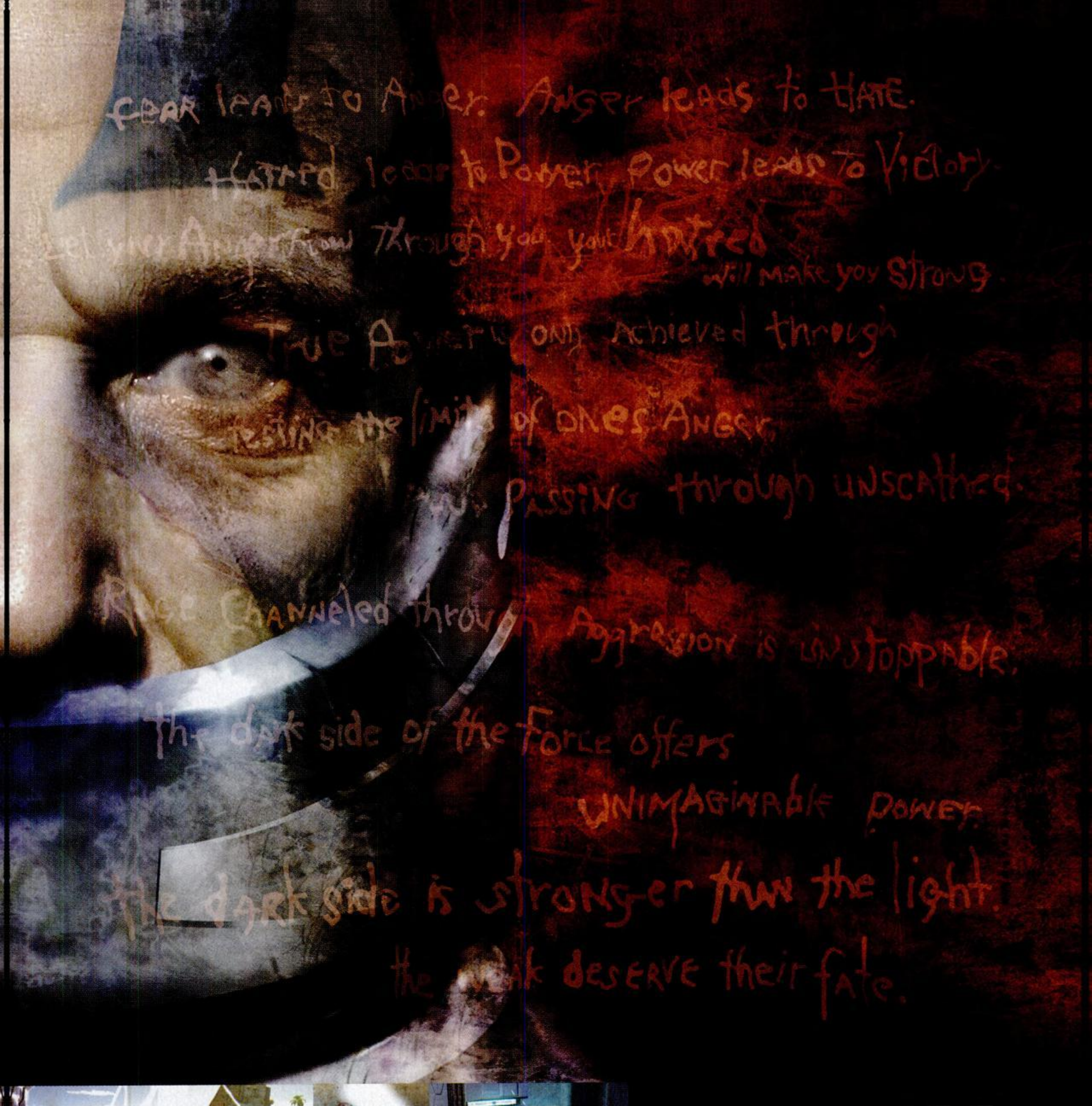

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*All scores based on Xbox version of the game according to Gamerankings.com on 9-05-03.

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Three's a Crowd

It's Intel vs. AMD vs. Apple in a bloody battle for CPU dominance! Three enter our benchmarking cage match, but only one seals victory!

BY GORDON MAH UNG

You can call it a cosmic silicon convergence. Such is the significance of the three biggest names in personal computing all releasing new desktop CPUs within weeks of each other. We wouldn't even begin to posit what this says about the vitality of the computing industry, but we can tell you that this once-in-a-millennium event makes for a damn good benchmarking showdown.

Apple came to market first with its new G5 platform. The G5 is based on IBM's PowerPC 970 chip and offers more memory bandwidth than Mac users have ever previously enjoyed. Next up was AMD's ground-breaking Athlon 64 FX, which introduces 64-bit computing to the PC desktop. And a few days after AMD announced the 64 FX, Intel completed the triangle with its Pentium 4 Extreme Edition, which offers more than twice the cache of its AMD competitor.

Thus the battle lines were drawn. This month we offer you definitive real-world road-testing of each CPU, using cross-platform applications that you can run at home.

Now, we'll be the first to concede that not all versions of the same application are afforded equal attention by their developers. The PC version of any given app might be coded to take advantage of the latest PC platform technologies, but the Mac version of the very same app might not take full advantage of the latest Mac technologies—and vice versa. Sometimes, software simply needs to "catch up" with new hardware platforms in order to take full advantage of new instructions, multithreading, and so on. That said, one can't really judge a CPU platform in isolation. The software that runs on the platform must be considered as well, and if the software just plain isn't ready, then that's a factor that must be considered in any consumer's final hardware decision.

To help choose the right cross-platform benchmarks, we ran a list of proposed tests past the folks at *MacAddict*, one of our sister magazines. For the most part, they blessed our selection of cross-platform tests. They also had a hand in creating one of our *Photoshop* test scripts, and suggested we use the cross-platform app *Mathematica* because of its popularity with Mac users.

We also obliged Apple Computers by running some of the very tests that the company references in its own benchmarking documents. One is *MacBibble*, an app that converts RAW image files into JPEGs (the PC version of this app is simply called *Bibble*). We also fulfilled Apple's request that we use the Mac application *Compressor* to benchmark DV-to-MPEG2 encoding times. As there is no PC version of *Compressor*, we used a similar app called *ProCoder* to test encoding on the PC side. Obviously, *Compressor* and *ProCoder* are entirely different apps, so comparing performance with these packages is sketchy. They both shoot out MPEG-2 files, but it's debatable whether the visual quality of each resulting file is identical.

Conducting cross-platform comparison tests is more difficult than ever before. Nonetheless, we're confident our showdown will reveal whether the G5 is truly the "fastest PC on the planet" (not just on paper, but in an actual working environment), and whether the Pentium 4 Extreme Edition grabs the performance crown back from AMD's Athlon 64 FX.

Let the battle begin!

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Intel*

CPU: Pentium 4 Extreme Edition

CLOCK SPEED: 3.2GHz

L1 CACHE: 8K

L2 CACHE: 512K

L3 CACHE: 2MB

TRANSISTOR COUNT: 178 million

PROCESS: 130nm

DIE SIZE: 237mm²

SPECIAL INSTRUCTIONS: MMX, SSE, SSE2

SYSTEM BUS: 800MHz

AMD*

CPU: Athlon 64 FX-51

CLOCK SPEED: 2.2GHz

L1 CACHE: 128K

L2 CACHE: 1MB

L3 CACHE: N/A

TRANSISTOR COUNT: 106 million

PROCESS: 130nm

DIE SIZE: 193mm²

SPECIAL INSTRUCTIONS: AMD64, MMX, SSE2, 3DNow Pro!

SYSTEM BUS: 2.2GHz

Apple*

CPU: Power PC 970 (G5)

CLOCK SPEED: 2GHz

L1 CACHE: 32K

L2 CACHE: 512K

L3 CACHE: N/A

TRANSISTOR COUNT: 58 million

PROCESS: 130nm

DIE SIZE: 118mm²

SPECIAL INSTRUCTIONS: Altivec

SYSTEM BUS: 1GHz (half core CPU speed)

* For our three-way showdown, we used the fastest-clocked version of each company's new chip; slower chip versions are not represented in this article. For Mac testing, we used a dual-processor G5 machine, as Apple is selling this configuration as a desktop computer. We could have pitted the G5 against dual-proc machines from Intel and AMD, but these machines aren't necessarily the most powerful PCs, and we wanted this showdown to be a three-way desktop battle.

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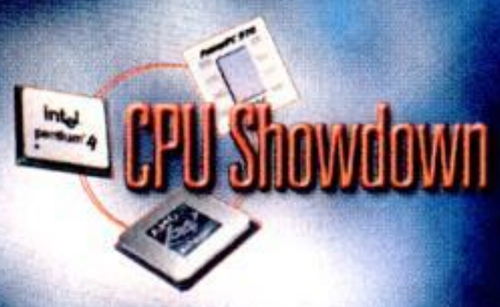
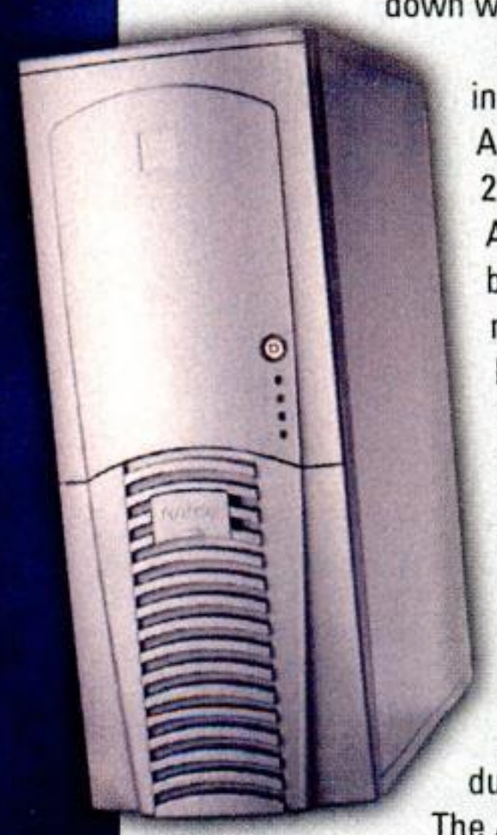


Meet the Competitors

Without further ado, we present the hardware configs that battled our battery of benchmarks. As with all CPU showdowns in this magazine, we tested the fastest iteration of each chip. Our goal isn't to see which platform offers the most performance per clock cycle, but rather which company is selling the fastest overall solution, price and processing efficiency be damned.

Athlon 64 FX-51

With its on-die memory controller, 64-bit capability, and 1MB of L2 cache, the Athlon 64 FX is fast. In fact, it trampled upon the 3.2GHz "vanilla" Pentium 4 in a benchmarking showdown we ran last month.



For this month's testing, we built our own AMD box, installing a 2.2GHz FX-51 into an Asus SK8N motherboard using nVidia's nForce3 Pro chipset. To best match the component configuration that Apple sent us, we outfitted the AMD box with an ATI Radeon 9800 Pro videocard, and included 1GB of memory (registered DDR400 operating in dual-channel mode). The AMD chip was paired with Windows XP Pro, and a 120GB parallel ATA Western Digital hard drive with 8MB cache. This is the same drive we used in the Intel machine. As you'll see in our profile of the G5, Apple used an ostensibly faster hard drive, but we don't think the difference is enough to skew test results.

Unlike the Pentium 4 Extreme Edition (P4EE) and Apple G5, both of which use traditional frontside buses to connect to their core-logic chipsets, the Athlon 64 FX-51 features an on-die memory controller that runs at full CPU speed internally. This memory controller, along with the large L2 cache, helps make the FX-51 a force to be reckoned with, even in its 32-bit mode. Although we have a beta version of the 64-bit edition of Windows XP Pro, we opted to run the 32-bit WinXP version for the sake of an even comparison.

In this battle, we don't expect AMD's chip to be number one in apps that take advantage of multithreading. The P4EE includes Hyper-Threading (a feature that provides "two virtual CPUs on one die" in best-case scenarios), and the Apple G5 box is actually armed with two separate CPUs. **www.amd.com**

Apple G5

Who would've ever thunk that a Mac would house an IBM chip ever again? Based on the same silicon that Big Blue uses in high-end servers and supercomputers, the 64-bit-capable PowerPC 970 is just spreading its wings at 2GHz—faster frequencies are imminent. Apple is also continuing on its unusual course of including not one, but two CPUs in its flagship consumer desktop machine. We're not sure how much sense it makes to sell desktop machines with two CPUs, especially when PC competitors like Dell and HP include (and charge for) just one. But from the power-user's point of view, multiprocessing is always an attractive proposition—provided you're running applications that tap both processors.

The Mac we used for this article was sent directly to our publishing company from Apple. (It's not a PC, folks. You can't build one for yourself on the kitchen table!) The G5 was outfitted with an ATI Radeon 9800 Pro, 1GB of DDR400 running in dual-channel mode, a 160GB Serial ATA Seagate 7200.7 hard drive with 8MB cache, and MacOS X 10.2. The G5's U3 core-logic chipset supports two 1GHz buses (one for each proc) and AGP 8x (just like the competition).

The G5's OS wouldn't reveal the core and memory clock speeds for the videocard, and Apple wouldn't respond to our requests for the info. This follows suit with traditional Apple style; the company has always kept its videocard speeds secret. We also had to rely on whatever version of video drivers that were pre-loaded in the OS. Apple doesn't reveal driver information, nor does it release separate driver updates or allow ATI to do so.

But, hey, there's no faulting the beauty of Apple's case design. The G5's tower is a breathtaking balance of aesthetics, ease-of-use, and smart thermals (though we are concerned about its dust filtration scheme). **www.apple.com**

Pentium 4 Extreme Edition

When Intel introduced the P4EE in September, scuttlebutt had it that many Intel insiders didn't even know of the CPU's existence. This should tell you that the P4EE was either a secret project or a desperate last-ditch response to AMD's FX-51.

To wit: In a perfect world, we think this showdown should've/would've included Intel's next-gen CPU, code-named Prescott. But Prescott may not arrive until early 2004, and instead we have the P4EE. To produce the P4EE, it looks like Intel simply grabbed its Xeon server processor (which sells for $3,700 a piece), jammed it into a Socket 478 package, and cranked up its bus to 800MHz. The P4EE (and its Xeon progenitor) differ from standard P4s by including a Marlon Brando-size L3 cache of 2MB. Add in 512K of L2 cache, and you have a total cache allotment exceeding 2.5MB, all running at full CPU speed. This caching approach mitigates the harsh penalties of main system memory latency by keeping more data and instructions cached close to the CPU core.

We ran the 3.2GHz P4EE in an Asus P4C800-E Deluxe motherboard using Intel's 875P chipset, 1GB of DDR400 in dual-channel mode, an ATI Radeon 9800 Pro, the previously mentioned WD1200JB hard drive, and Windows XP Pro.

Intel's frontside bus still cranks along at 800MHz, which was impressive a few months ago, but now seems tame compared with its competitors' faster busses. Regardless, the question surrounding Intel is whether the P4EE is just a proof-of-concept intended to embarrass AMD, or a chip that can be purchased in multiples of 1,000. Though we're receiving P4EE machines for review, Intel hasn't yet priced the chip, and as of press time it wasn't being sold in individual units online. That said, Intel doesn't intend to sell 25 million P4EEs. It simply needs to reach any enthusiast who would otherwise buy AMD's FX-51. **www.intel.com**

(Continued on page 50)

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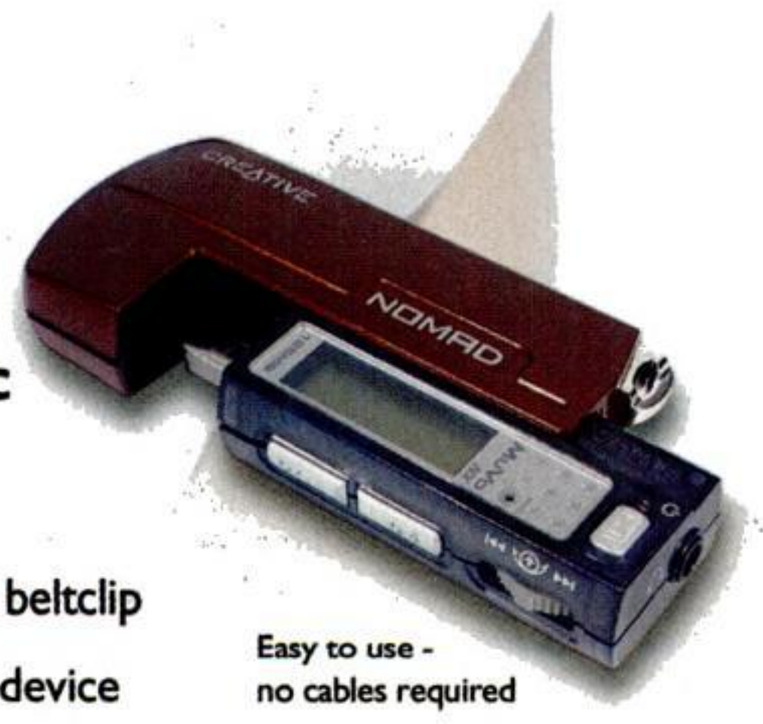

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And Now Our Benchmarks

Here's a look at the real-world, cross-platform apps that we were able to find for testing. Some of the software is rather arcane, and some needs updating to take advantage of modern CPUs and chipsets. Still, all but one app is cross-platform, so this group offers the best chance of apples-to-apples-to-apples comparisons. See page 54 for analysis.

MATHEMATICA 5.0

This app can perform all the ridiculously complex math calculations that intimidate 99.99 percent of the U.S. population. For benchmarking, we used Stefan Steinhaus' newest notebook script. Among other actions, Steinhaus' script creates a 1,000 x 1,000 Toeplitz Matrix, computes 260 Euler numbers of the polynomial n, and calculates Pi to 3 million digits. All told, the test pushes a grab bag of CPU- and cache-intensive floating point and integer tasks. From what we can gather, the app makes little to zero use of Hyper-Threading or a second CPU. The developer has a G5-optimized version in the works, but it wasn't ready at press time. **www.wolfram.com**

SETI@HOME

SETI@Home—the world's first mainstream distributed computing project—uses spare CPU cycles on home users' computers to help search for extraterrestrial life. For our test, we used the command-line version of the app on both platforms. Because each unit the program analyzes is different, we used the benchmarking unit developed by Team Lamb Chop of Arstechnica.com. To run the test, we simply plugged in the unit, and noted how long it took to finish. The *SETI@Home* coding team has long been criticized for not adding optimizations for the P4 or Athlon XP CPUs, but the team has maintained that it isn't interested in speed. Instead, it wants accuracy, which the current code provides. For the most part, the app is floating point-dependent, and seems to thrive on faster FSB speeds and low-latency RAM access. **http://setiathome.ssl.berkeley.edu**

UNREAL TOURNAMENT 2003

We used the retail versions of the game for both OS X and Windows XP Pro, and patched them with the latest available updates. The game, which uses the latest version of the Unreal engine, comes with a set of predefined benchmarks that test "fly-by" modes (where scenes whiz along at dizzying speeds), as well as botmatches. Unfortunately, while comparing Mac test runs with PC runs, we discovered that the benchmarks don't always run the same content—save for one specific test, the "asbestos" fly-by sequence. Thus we ran this sequence at 800x600 with the audio disabled on all three machines, and recorded average frames per second. Running the test at a low res of 800x600 helps reduce any bottleneck imposed by the video subsystem, and puts a greater onus of performance on a system's CPU, RAM, and mobo chipset. **www.unreal.com**

JEDI OUTCAST

This first-person shooter runs a heavily modified Quake III engine. To generate an average frames-per-second score, we use our own custom demo running at 640x480 with audio disabled. We've always found that this test is almost entirely CPU-reliant. In fact, it's mostly immune to videocard hardware upgrades unless you enable antialiasing and extreme visual quality settings. The game itself is OpenGL, and has historically favored nVidia graphics. **www.lucasarts.com**

QUAKE III

This game first came out when P-III 500s and TNT2 cards were considered swift, but it's still regarded as an excellent CPU benchmark. We ran the patched 1.32 version, and used the built-in Four demo at 640x480 with visual quality set to normal and the audio engine disabled. Again, the low res helps expose CPU performance. As one CPU vendor told us, "Carmack is a human compiler." In other words, his engine code is so tight, the game always runs faster when you throw more silicon at it. Increases in CPU speed, cache size, and bus speed all pay tangible dividends. The game is also a voracious system-bandwidth hog, and, on the PC side, traditionally favored the P4 until the Athlon 64 FX arrived. **www.idsoftware.com**

INDESIGN 2.0

Adobe's page layout program is taking the publishing industry by storm. For our tests, we took an actual 13-page feature created in *InDesign* for our November issue, and converted it into an *Acrobat* PDF file. This is how our art department prepares files for press, so it doesn't get any more real-world than this! The PDFing process taps all computer subsystems. **www.adobe.com**

PHOTOSHOP 7.0.1

We used two different action scripts to test performance with the world's most respected image editing app. The first script was created by *MacAddict*, and uses several very popular filters and operations, such as Gaussian blur, dust and scratches, unsharp mask, and a file conversion from RGB to CMYK. It must be noted that while all of the script's filters and operations are popular among creative professionals, a good many of them take advantage of the G5's unique Altivec instructions and multithreaded CPU architecture. For this very reason, we created our own second script that uses just about every filter in the stock *Photoshop 7.0* install (three filters we would've liked to have included forced our script to stop). By employing every filter, we erase the possibility of platform favoritism entirely, though we concede that some filters simply aren't used very often (or at least *shouldn't* be used very often). For the *MacAddict* script, we used a 50MB PSD file, and for our script, we used a 2MB JPEG. For all tests, we set *Photoshop* to use the maximum amount of RAM. *Photoshop* stresses the entire computing pipeline from

(Continued on page 52)

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This jungle makes the Amazon seem like a botanical garden.

Dungeon Siege®

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the hard drive to CPU, but because the *MacAddict* script uses a gigantic 50MB file, there's likely a little more pressure put on the hard drive. **www.adobe.com**

BIBBLE/MACBIBBLE

When snaping a picture, some digital cameras can dump the contents of their image sensors to a noncompressed image file (aka a "raw" file). Think of it as digital negative. This helps preserve the image's actual visual properties, but RAW files are a PITA to deal with. They eventually need to be converted into a more popular format, and conversion takes time—up to 20 seconds per picture. For this test, we timed how long it took to convert 85 files from Nikon's raw NEF format to TIFF using Bibble Lab's *Bibble* on the PC and *MacBibble* on the Mac. These file conversions are almost entirely CPU-dependent. Both *Bibble* and *MacBibble* support multithreading, so the P4EE's Hyper-Threading and the G5's dual procs should come into play. **www.bibblelabs.com**

QUICKTIME 6.3

On all three machines, we used the app to convert a 2GB digital video file into a *QuickTime* MOV file using default settings. But let's be clear: This test was picked to humor *MacAddict*. The *QuickTime* code, after all, was written by Apple! Oh well. We don't know any PC users who would ever choose to encode to *QuickTime*, but the app is indeed cross-platform. Video encoding speeds are typically CPU-dependent, though hard drive write speeds can also have an influence on performance. **www.apple.com**

COMPRESSOR/PROCODER

The last test—DV-to-MPEG2 conversion—is our most controversial, as our testing procedure for the G5 was borrowed directly from Apple (as per Apple's very strong request), and is by definition a blatant apples-to-oranges comparison. Nonetheless, it's the same testing that Apple quotes in its own benchmarking reports, so we figured readers would be interested in *Maximum PC's* take.

Apple's test involves two different apps that do ostensibly the same type of video conversion. On the G5, the test uses the Mac-only app *Compressor*. This app offers two encoding quality settings: "fast" and "high-quality." On the PC side, Apple opts for Canopus's *ProCoder 1.0*. This app provides some extra control parameters, but it too offers two basic quality settings: "high-speed" and "mastering." Each app is tasked with converting a 1.5GB DV file.

The first problem with this scheme is obvious: *Compressor* and *ProCoder* 1.0 are entirely different apps! Apples to oranges? Definitely. Still, there's some validity to the reasoning that says, "It doesn't matter *how* you convert the video. All that matters is which computer finished the job first."

Fair enough, but this brings us to the second problem: It's very difficult to discern whether the similarly named settings in each app actually produce the same visual quality results. For what it's worth, Canopus says that *Compressor's* "high-quality" setting actually produces visual quality that falls between *ProCoder's* "high-speed" and "mastering" settings. Canopus also told us that using the "mastering" setting puts complete emphasis on visual quality while simultaneously ignoring processing time, hence the warning that appears when the "mastering" setting is enabled ("Mastering is the highest-quality setting, but encoding can be 10-20 times slower than the other options"). The upshot is that Apple may—*may*—be asking PCs to do a harder workload. Regardless, the issue is moot because we decided to run the test essentially as Apple defines it in its benchmarking document (our only change was to update *ProCoder* to a new 1.5 version). In the benchmarking chart, you'll also find that we compared *Compressor* at its "fast" setting with *ProCoder* at its "high-speed" setting. As with any video-encoding test, the *Compressor/ProCoder* battles reveal CPU power, and how well an OS copes with large file sizes.

(Continued on page 54)

And Without Further Ado... The Results!

THE TESTS	AMD Athlon 64 FX-51	Intel P4EE	Apple Dual G5
Mathematica 5.0	**572 sec**	639 sec	997 sec
SETI@Home	**106 min**	111 min	173 min
UT2003	332 fps	**334 fps**	80 fps
Jedi Outcast	130 fps	**133 fps**	72 fps
Quake III	445 fps	**501 fps**	404 fps
InDesign 2.0 Export to PDF	47 sec	**46 sec**	61 sec
Photoshop 7.0.1 All Filters	269 sec	**266 sec**	330 sec
Photoshop 7.0.1 MacAddict Filters	38 sec	41 sec	**37 sec**
Bibble/MacBibble	451 sec	354 sec	**240 sec**
QuickTime 6.3 Export to MOV	803 sec	744 sec	**706 sec**
Compressor "Fast" vs. Procoder "High-Speed"	**225 sec**	**225 sec**	263 sec
Compresssor "High-Quality" vs. Procoder 1.5 "Mastering"	1105 sec	1190 sec	**724 sec**

Best scores are bolded in red

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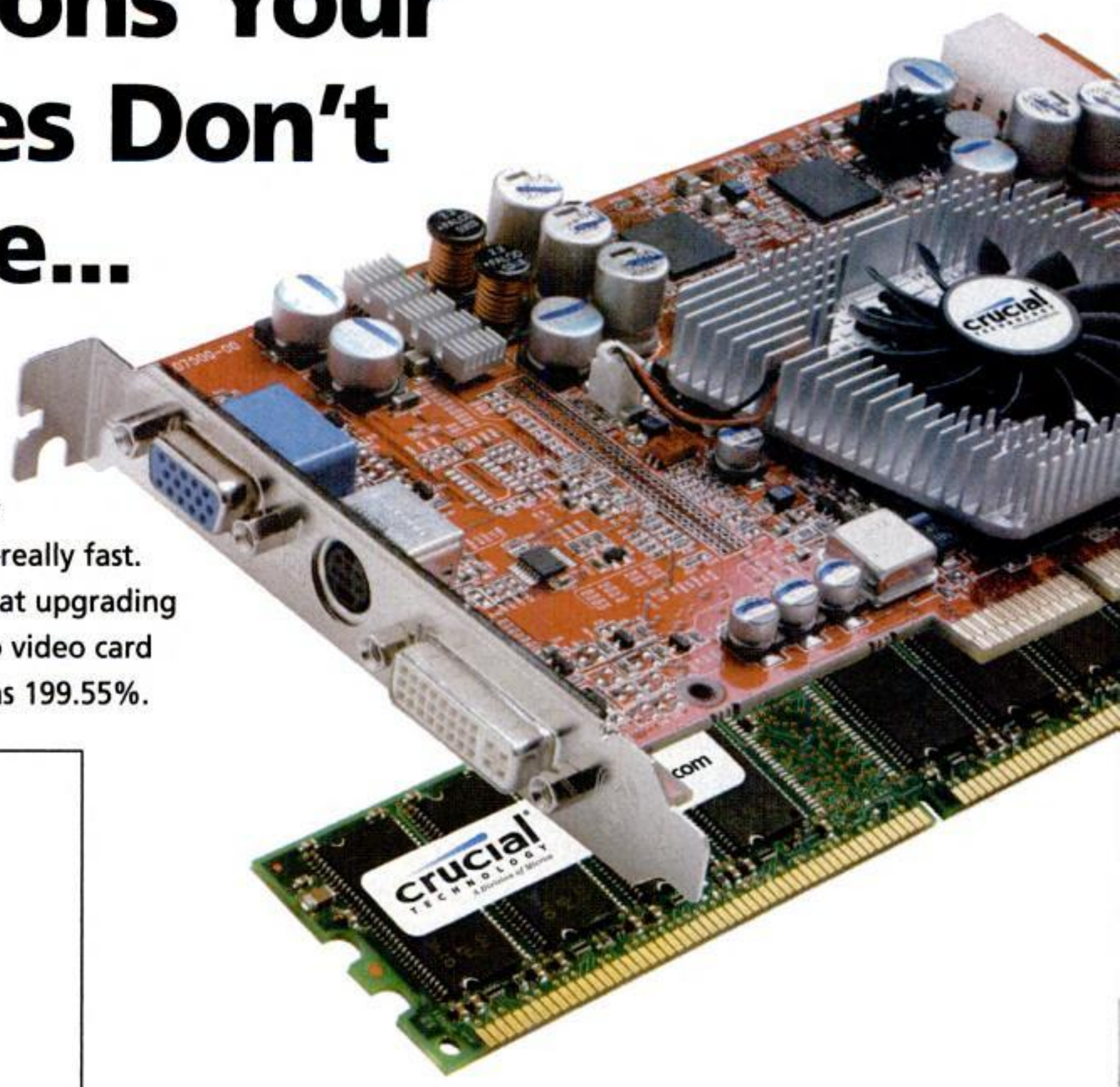
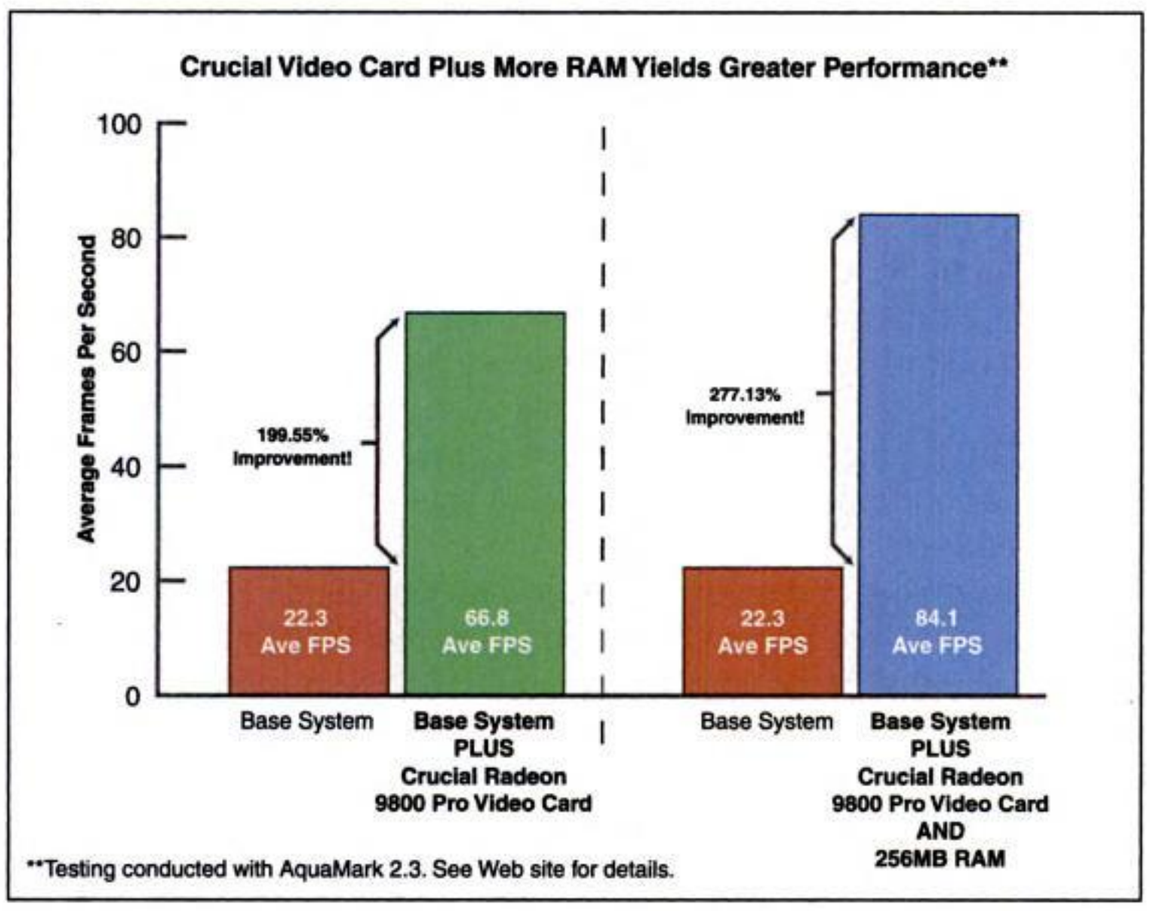
Two Secret Weapons Your LAN Party Buddies Don't Want You To Have...



New tests reveal the power of this killer combo!

Okay, the first "secret" isn't really so secret. You probably know very well that the Crucial Radeon™ 9800 Pro video card is fast—really fast. In fact, tests conducted by the Crucial Performance Lab show that upgrading from a GeForce2 GTS 32MB card to the Crucial Radeon 9800 Pro video card can improve average frame rate benchmark scores by as much as 199.55%.



**Testing conducted with AquaMark 2.3. See Web site for details.

The second secret revealed!

But the tests showed something else. Something so subtle, we're embarrassed to say we almost missed it. According to the tests, maximum performance can be achieved by upgrading *two components at the same time*—the video card and the RAM. With the Crucial Radeon 9800 Pro video card and an additional 256MB of RAM, our test system showed a 277.13% improvement over the base system in average frame rate benchmark scores.

So now you know. Upgrade your video card to a Crucial Radeon 9800 Pro and get a big boost in performance. Throw in some more RAM while you're at it, and get a bigger boost in performance. Now that's a killer combo your LAN party buddies will be drooling over!

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What It All Means—To You, Your Brethren, and Your Apple-Loving Friends

The G5 separates airflow for the processors, RAM, power supply, videocard, and optical drives.

Let's just get it out of the way: The Macintosh G5 is most certainly *not* the "world's fastest PC," as Apple so boldly asserts. Its architecture looks hot on paper, no doubt, but in many of our tests, the G5 platform was in fact far, far, slower than the fastest personal desktop platforms based on AMD and Intel CPUs.

This, however, doesn't mean the G5 is a complete loser. Quite the contrary. In fact, we're happy to say—for the very first time—that the new Apple Dual G5 is a legitimate PC that must be taken seriously. In the old days, we could count on Apple's benchmark results to be as overcooked as crazy Aunt Patty's pot roast. But today, while we certainly found pockets of shameful performance, we also see a silver lining to Apple's cloud. More about this later; for now let's look at the test results.

The Dual G5 fell down the hardest in a couple tests we thought it would own. In *Mathematica*, for example, the Mac was 35 percent slower than the Pentium 4 Extreme Edition and 42 percent slower than the Athlon 64 FX. The G5 dualie was also 39 percent slower than the Athlon 64 FX and 36 percent slower then the Pentium 4 Extreme Edition in the floating-point intensive *SETI@Home* benchmark. We were pretty stunned by these performance differences, as we expected the G5 to equal or exceed PC performance, what with its 1GHz system bus and considerable floating-point features, which look so good on paper.

So why such poor floating-point performance? After all, the G5's PowerPC 970 processor is a derivative of chips used in supercomputing clusters made by IBM.

We think it comes down to the software code. The most logical explanation is that the code in *Mathematica* and *SETI@Home* just can't take advantage of all that the G5 has to offer. Apple and the Mac faithful may shrug this off as a minor, temporary problem, but if history has shown us anything, it's that software optimizations can take longer than expected. For example, it's taken almost three years to get the code-base up to speed for the Pentium 4's uniquely long processing pipeline and special instructions.

Regardless, the new Mac was a massive dog in these two apps, and would likely be so in other floating-point apps that haven't been expressly recoded for the G5. On the PC side of things, the Athlon FX-51 kicked major P4EE ass in these two math-intensive tests.

Gaming, you ask? The G5 blew embarrassing chunks in the very popular *Unreal Tournament 2003* and *Jedi Knight II.* Since we ran both games at low resolutions and with audio disabled, we can't blame the abysmal numbers on the G5's video or sound subsystems. And we do mean abysmal. Horrible. Ugly. Perhaps even criminal. Yes, we're talking just that slow. In *UT2003,* the P4EE and Athlon FX were near identical in performance, but some 317 percent faster then the new G5. No, not 17 percent—*three hundred and seventeen percent.* In *Jedi Outcast,* the PC duo turned in scores that were about 80 percent faster than the G5. That's a less egregious differential, but it's still a felony, not a misdemeanor.

Because the G5 scores were so low, we checked inside the box to make sure someone hadn't swapped an ATI Rage Pro for the ATI Radeon 9800 Pro. Nope, the latter was present and accounted for.

AND THEN CAME QUAKE III

Before we began testing, we weren't so sure the PC would retain its dominance over the Mac, what with the impressive system specs of the G5. But after a few test runs, we weren't sure if we should even continue testing. After four tests, the affair was shaping up to be a complete rout—Apple's version of Dunkirk, with troops fleeing for their lives across the English Channel. Could the PowerPC 970 chip possibly be this slow? We couldn't believe it. Maybe something was wrong with Apple's drivers or the OS itself. We continued our tests, and actually hoped that the G5 would bounce back.

Well, bounce back it did. In *Quake III Arena,* we finally saw respectable performance from Apple. Although the G5 was still the slowest of the three machines, its score was nothing to be ashamed of. The Athlon 64 FX was about 10 percent faster than the G5, and the P4EE was about 24 percent faster. Considering that the Athlon 64 FX roundly trounces non-Extreme P4 and Athlon XP machines in this test, that's a respectable showing for the G5. In fact, in this benchmark, the G5 is about on par with a 3.2GHz P4 and *faster* than an Athlon XP 3200+.

The *QuickTime* test found the tables completely turned for the G5. Encoding a 2GB DV file to Apple's *QuickTime* MOV format gave the G5 its first win—it was about 5 percent faster than the Intel box, and about 14 percent faster than the AMD box. Sure, PC users may croak that using an app written by Apple skews the test, but the truth is that *QuickTime* does spit out perfectly fine DV conversion, the G5 works with it splendidly. *QuickTime* isn't the world's most popular format for sharing video, but, hey, that's Apple's problem, not ours.

The G5 also did well in the *Photoshop 7* action script crafted by *MacAddict*—it was one second faster than the Athlon 64 FX, and four seconds faster than the P4EE. As for the *Maximum PC* script that uses all filters, fortunes reversed and the FX-51 and P4EE were 18 and 19 percent faster than the G5, respectively. It's difficult to judge exactly which platform is the *Photoshop* king, because it's so incredibly easy to model a benchmark script that will elicit

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the results you most want to see. So it really comes down to which benchmarking approach you most respect, ours or *MacAddict's*. You have the information, reader. It's on page 52. You make the call.

As far as we're concerned, PCs take the *Photoshop* throne. We can say the same for *InDesign 2.0* PDF conversion, in which the AMD and Intel chips were 23 and 25 percent faster than the G5, respectively.

In the *Bibble/MacBibble* RAW conversion tests, the G5 nailed an unambiguous victory, finishing its conversion roughly 47 percent faster then the Athlon 64 FX and 32 percent faster then the P4EE. As Keanu would say: "Whoa." So how does the G5 go from being the dunce in *SETI@Home* and *Mathematica* to the head of the class here? We have a few theories. The first is that the *Bibble* PC code may not have received enough developer attention. Is it possible that Altivec instructions are supported in *MacBibble*, but no similar SIMD instructions (that is, SSE2) are supported in *Bibble*? And if SSE2 is supported by the app, is it possible that it's not properly detected by the Athlon 64 FX, which showed the poorest performance?

The other factor likely at play is the multiprocessor support—*Bibble* and *MacBibble* both support multiprocessor machines, such as the G5. So let's take an inventory. Our AMD box has only once processor. Our Intel box also has only one processor, but that processor supports Hyper-Threading, which provides multiproc capabilities on a cycle-by-cycle basis. As for our Apple box, it sports two physical processors—thus it has a decided advantage in the *MacBibble* test. The upshot: Apple would do well to encourage all developers to code for multithreading, because it clearly makes a difference.

As for our final test—DV-to-MPEG2 conversion using two different apps—we're finding it difficult to give much credence to the results. As you can see, the two PCs blew by the G5 in the tests that were set up for lower-quality MPEG2 encoding, and in high-quality mode, the tables turned. But, again, we can only repeat the obvious: If the high-quality mode in *ProCoder* cranks out better-looking, less-compressed video than the high-quality mode in *Compressor*, then the PCs are preordained to take longer—and thus the test itself is suspect.

AND NOW FOR THE MINORITY OPINION...

We asked Rik Myslewski, *MacAddict's* editor-in-chief, to weigh in on our testing and analysis. Here's what he had to say:

While we here at *MacAddict* are drooling over the Athlon 64 FX's on-die memory controller and the Pentium 4 Extreme Edition's 2MB L3 cache, and while we also grudgingly concede the lead to you PC folks in game performance, we're pleased as punch that it took two expensive, just-released, specialized procs (unavailable to normal consumers searching the web sites of Dell, Gateway, HP, and others) to edge out a standard, off-the-shelf dual-2GHz Power Mac G5. In tests that mimic work performed on non-hot-rod PCs by normal working shlubs like, oh, about 99 percent of the personal-computer market, the G5 (née IBM PowerPC 970) rocks. We look forward to testing the G5 against the garden-variety P4s that litter the computing landscape.

And the Winner Is...

After looking at the official test results that appear on page 52, and after considering the overall performance of all three platforms, we have to declare Intel's Pentium 4 Extreme Edition the winner by the thinnest of margins. It looks like the P4EE's large L3 cache is giving the basic P4 core a big performance boost in not only multimedia apps but also games. The P4EE's Hyper-Threading is also showing more of its value, and is responsible for some of the performance wins you see in this article.

The Athlon 64 FX-51, however, is so damned close, we're reluctant to call it a "second-best" CPU. Yes, it won fewer benchmark rounds in *this* competition, but its overall performance was just a hair behind the P4EE's, and in some "unofficial" tests that we ran on just the Intel and AMD machines, the FX-51 showed superiority in games. For example, in *Halo*, the FX-51 beat the P4EE by about six frames (62.4fps to 56.5fps). It also triumphed in the *UT2003* Botmatch demo (96.9fps to 93.8fps). We think you can credit the FX-51's on-die memory controller for these wins.

When you factor in the FX-51's 64-bit readiness and the fact that the P4EE appears to be more of a "proof-of-concept" than a shipping product, we think you too will agree that AMD deserves its Gear of the Year honors. Indeed, raw benchmark wins aren't everything.

As for the G5, it takes a distant third-place standing (which would likely be fourth-place if we had tested a generic Pentium 4), but things are actually looking up for Apple. The latest Mac is a wonderful performer when running code that supports Altivec and dual CPUs. In fact, we're comfortable saying that the G5 is likely to pull ahead of single-proc PC systems when running heavily multithreaded tasks.

Apple's biggest problem isn't its hardware, but rather its current software support. In apps that *aren't* optimized for the G5's unique benefits, the Mac's performance is a travesty. We'd even bet that in some apps, the G5 is no faster than the G4. We saw a similar problem when the Pentium 4 was introduced. Although it was clocked about one-third faster then the Pentium III, in many apps it was slower because the code of the day just couldn't take advantage of the P4's architecture and special instructions. But now, three years later, the P4 is a screamer. Apple's G5 could have the same fate.

Regardless, we can finally say that Apple has introduced a worthy competitor to the PC platform. ■

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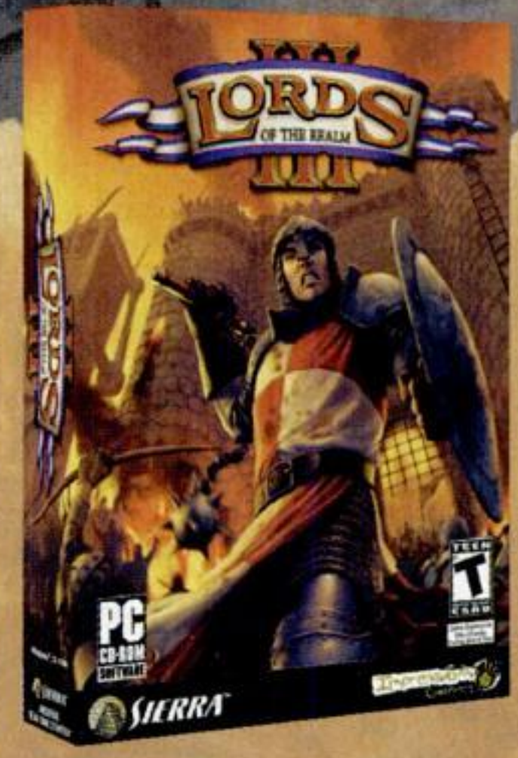

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KATIE HOCH
wins the $3,000 shopping spree from CompUSA!

For more pics and info on Katie's rig, go to www.personal.psu.edu/klh340.

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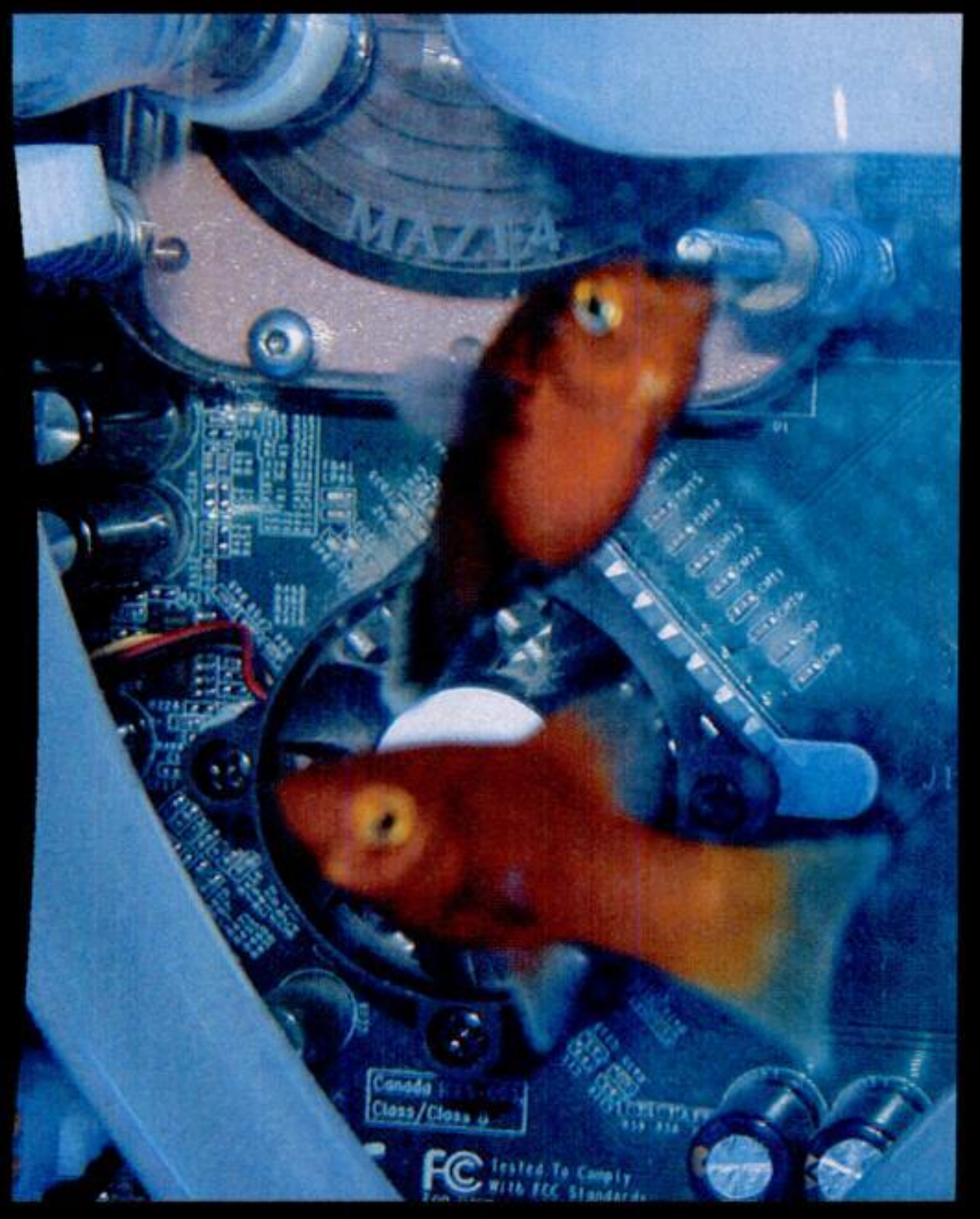
We proudly present the winner of our Coolest PC Case Modding Contest

Seldom do we receive a case mod that's configured with components that actually eat, breathe, poop, and reproduce. Sure, hard drives eat a lot of data, and they are prone to pooping out on us at the most inopportune moments. But we're not talking about hard drives, Chester. We're talking about fish. Blood Fin Tetras, Zebra Danios, and Red Wagtail Platies. And in the dorm room of one Katie Hoch, a mechanical engineering student in Pennsylvania, the fish are swimming perilously close to an Athlon XP 2000+ processor.

Such is the cool factor that Katie's rig brought to our Coolest PC Case Modding Contest, which was co-sponsored by the upgrading fanatics at CompUSA. For impressing our editors with the most striking blend of craftsmanship, creativity, and originality, Katie wins a whopping $3,000 CompUSA shopping spree to buy whatever PC gear she desires. You can see the runners-up on the next page, but for now let's focus on Katie's bio-mechanical friendship exchange program.

As you can gather from the photos, the rig is divided in two parts—PC components on one side, fish and fish hospitality apparatus on the other. This puts a nice firewall between the sea life and all the electrically frisky PC components. Now, lest you think that any of this case was built from some type of "Fish Tank PC Combo Kit," we can assure you that the entire friggin' thing was built from scratch using random scraps of metal, quarter-inch Lucite, and homemade acrylic cement. Did Katie go through a lot of Dremel blades? Indeed she did—in excess of 200. "I believe I was solely responsible for supporting the Dremel Corporation during the months of July and August," says Katie.

While the rig's CPU is indeed water-cooled, Katie never considered doing double duty with either her fish tank water or radiator water. "I knew from the beginning that trying to keep fish alive in a water-cooling system's water wouldn't work," she says. "But, mainly, I didn't want fish food—and what fish food becomes—zipping through my CPU block."



QUESTIONS WITH THE MASTER MODDER

Q: Have you benchmarked the fish?
A: Yes, I ran *FISHmark2002*, and I have the fish marks all over my bench to prove it.

Q: The CPU's not overclocked, so why not use traditional fans?
A: My last setup sounded like a 747 taking off. Stock processor speeds with six case fans and a Thermaltake Volcano 7 was still leaving me with a CPU temp of 55–60° C. I just couldn't stand all the noise. My proc's down to about 35° C now, and all I hear is a gentle burbling sound from the air bubbles in my tank.

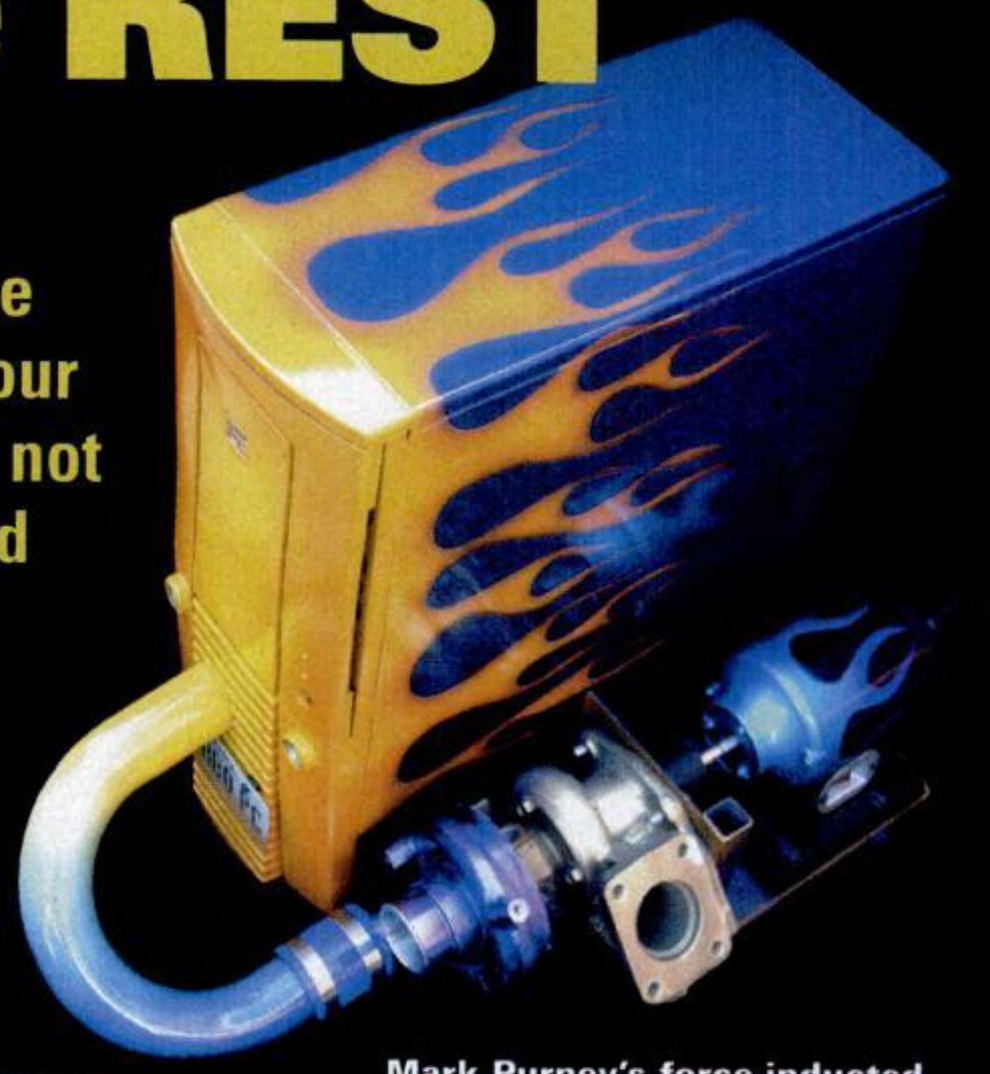
Q: How do you think the fish feel about swimming so close to a surging hotbed of pure PC power? Nervous? Proud?
A: They are reverent of the awesomeness my computer generates. Five times a day they genuflect in the direction of the processor. Honestly, because the water-cooling and aquarium are separate systems, they don't even know anything unusual is going on.

Q: What do you think you'll get during your CompUSA shopping spree?
A: The big thing I'm considering is a laptop, as it would be great to have a computer I can easily transport. Fish aren't usually very transient. Well, except for salmon.

The BEST of the REST

These awesome rigs won our hearts, but not the grand prize

Push down on the fangs of Alex Wiley's spider case to eject a disc from the optical drive. The whole rig shines with clean, sophisticated design.



Mark Purney's force-inducted PC uses an honest-to-goodness automotive turbocharger to help cool down his internal components. Go to http://raktron.com/turbopc for details.

Chris Gair's cube rig may not be the height of originality or craftsmanship, but who can resist this much exposure to raw PCB?

Gary Willett sculpted his monster entirely by hand. The long-time dental lab tech even used professional dental plastic to make his monster's choppers!

Yet another masterpiece from the shop of Paul Capello. It might have won had we not seen so many Matrix-themed mods of late. Go to Thebestcasescenario.com for details.

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The Springs are plastic coils that can be easily wrapped around case cables and wires to keep clusters contained. They promote overall interior organization, not to mention pizzazz. Each package of Springs includes three different sizes, and you can choose from a variety of colors (some even glow in the dark!). It's a baby step, but we all have to start somewhere. **www.lizard-tree.com**

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SmartDisk FlashTrax

It's as if the folks at SmartDisk discovered a portal to our minds, so closely does the FlashTrax resemble a product we've been dreaming about. It's the perfect solution for those times when you're out and about with your digital camera and your memory is nearing capacity. Just dump all your image files onto the FlashTrax. It's got storage to spare (either 30GB or 80GB), and its 3.5-inch LCD screen makes for a handy image viewer.

And that's not all, folks. The FlashTrax is equipped with the usual assortment of audio controls, so you can just as easily use the device to store and enjoy music. The FlashTrax natively reads CompactFlash Type I/II cards and IBM Microdrives, but an adapter can be used for other formats. It interfaces with your PC via Hi-Speed USB. **www.smartdisk.com**

$500 (30GB model)

Karaoke TV Star

Let your inner songbird soar. That's all karaoke asks of you. And Karaoke TV Star makes it easy to oblige. The KTVS mic connects to your TV, and your TV screen acts as the interface. Buttons on the mic let you make a selection from the song list, change the acoustics, add vocal effects, and even monitor your pitch (though this can be rather humbling.)

Song lyrics are displayed in nice big type, and change color at the pace you should sing them. A USB connection lets you download additional songs from the Internet. Perhaps best of all, the cable between mic and TV is 10 feet long, allowing ample freedom for accompanying dance numbers. **www.ivl.com**

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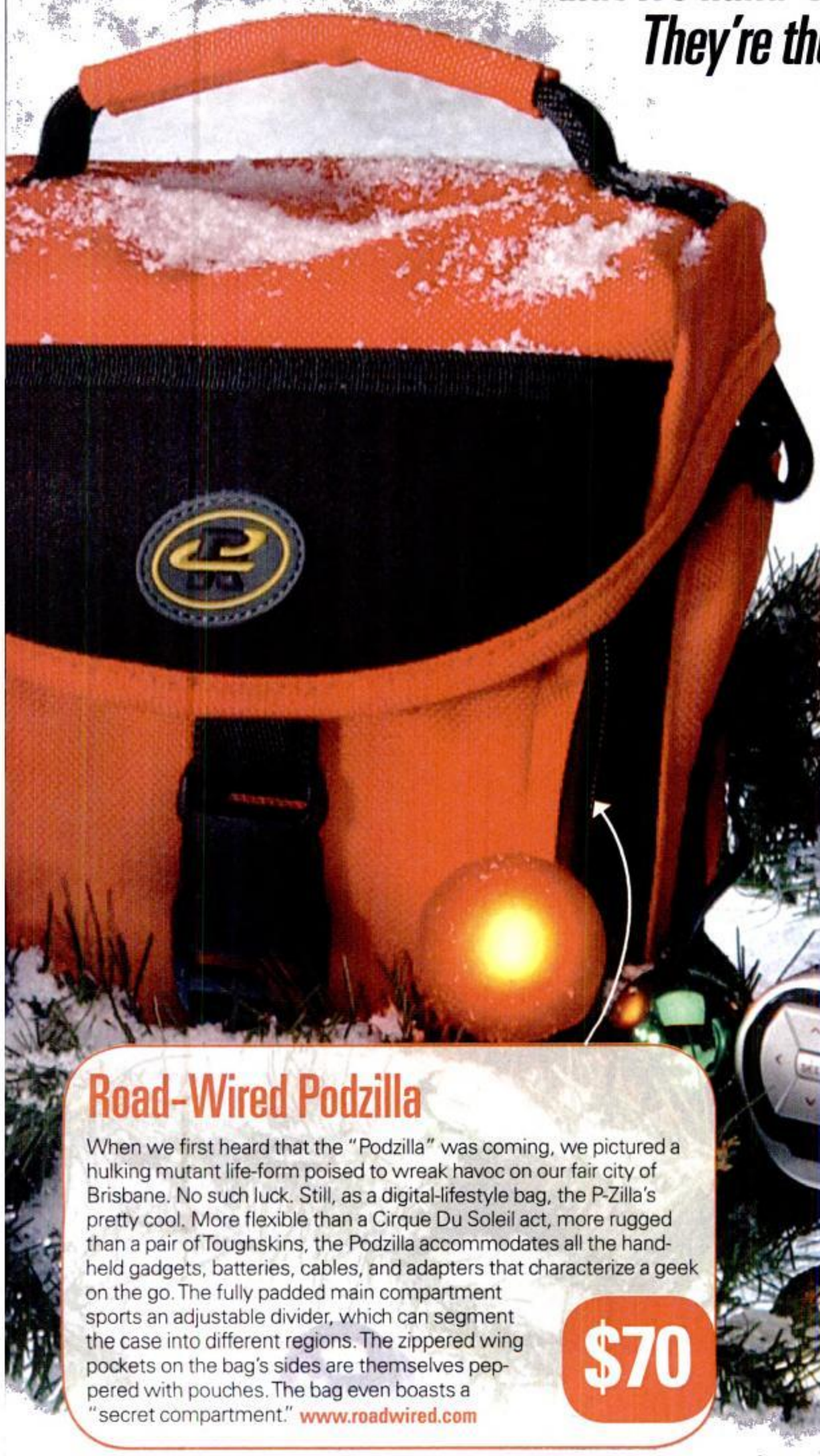
Happy New Gear

In a fit of folly befitting the season, we put aside benchmarking and apples-to-apples comparisons for the good old-fashioned pursuit of "stuff"—tech gear and accessories that we hand-selected and played with ourselves. They're the ideal gifts for geeks this holiday.



Kenwood Here2Anywhere

The benefits of owning a Kenwood Here2Anything radio are two-fold. First, the H2A is a receiver for Sirius' satellite broadcasts. So, for the monthly subscription rate of $13, you get commercial-free radio up the ying-yang. Everything from Latin jazz to 80s pop to classic punk to financial news, at your beck and call. On top of that, the Here2Anywhere is compact, lightweight, easy to use, and explicitly designed for portability. "Docking kits" that include a cradle, adapter, antenna, requisite cables, and mounting hardware are available for both the home and car (purchased separately), making it possible for you to take your Here2Anywhere *everywhere*. (Home docking kit, $70; car docking kit, $30)

www.kenwoodusa.com

$130

Road-Wired Podzilla

When we first heard that the "Podzilla" was coming, we pictured a hulking mutant life-form poised to wreak havoc on our fair city of Brisbane. No such luck. Still, as a digital-lifestyle bag, the P-Zilla's pretty cool. More flexible than a Cirque Du Soleil act, more rugged than a pair of Toughskins, the Podzilla accommodates all the handheld gadgets, batteries, cables, and adapters that characterize a geek on the go. The fully padded main compartment sports an adjustable divider, which can segment the case into different regions. The zippered wing pockets on the bag's sides are themselves peppered with pouches. The bag even boasts a "secret compartment." **www.roadwired.com**

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Gift Guide

Gyration Media Center Remote

No one likes the remote control that comes bundled with Windows Media Center. It's a big, clunky rascal populated with far too many buttons that seem inconveniently placed. So it's no wonder the Gyration Media Center Remote has us pleased as punch that's been properly spiked.

Gripping the GMCRemote by its narrow, lightweight, comfortable handle, you'll find you can easily access the function buttons with a single thumb. The buttons are manageable because they're limited to the most frequently used actions, such as volume control, channel selection, and play/fast-forward/rewind commands. Other Media Center options can be accessed using in-air gestures and the integrated mouse. Wave the Remote in front of the screen, and a cursor tracks its motion; the right and left mouse buttons are conveniently located at the remote's slender waist.

www.gyration.com

$150

Shure E Series Earphones

The easiest way to improve the sound of your MP3 player is by disposing of the bundled earbuds. That's right. Toss 'em. *Don't even give them away to a friend.* Not even the fancy-lad set that comes with the iPod can approach the sound you'll get from Shure's E Series. Shure's E5c earphones have dual drivers for high and low frequencies and an inline crossover to blend the two (the E2c series uses a single driver). And unlike noise-canceling headphones that add frequencies to neutralize background noise, the E Series uses a "Fit Kit"—soft, flexible pleasure nubs that conform to your inner ear—to block out external noise and allow you to hear more detail at lower volumes. And, ooh, what detail you'll hear. Solid, gut-punching bass and crisp, ear-piercing highs, even in the lower-end unit. Yes, they're expensive, but think of all the money you saved with *Kazaa*! **www.shure.com**

$100 E2c

$500 E5c

Maxtor OneTouch Backup Drive

Those who don't learn from history are doomed to repeat it. For example, more than a half-million scrolls are said to have been destroyed when the Library of Alexandria was torched to the stoop (including, O scholarly ones, most of the works of Sappho—*damn*). Is this to be the fate of your data? This pedagogical disaster could have been avoided if only the librarian had bothered to back up everything with Maxtor's OneTouch backup drive. Not only could the 7200rpm Maxtor drive have held copies of every scroll in the joint, but probably the MP3 collection of the entire

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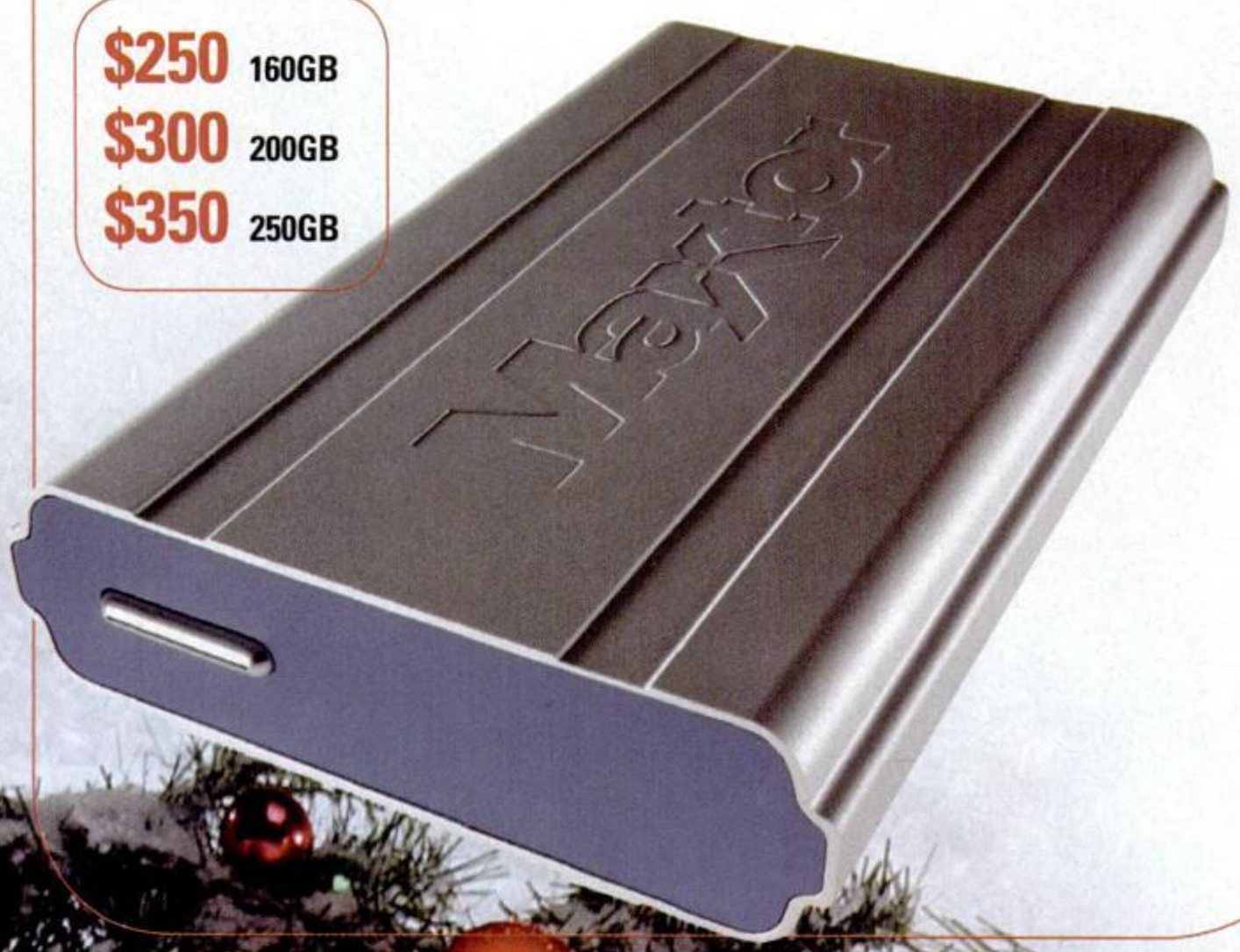

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Power of Two Digital Clock

Being a geek is like being part of a secret society. Most people don't know what the heck you're talking about, are baffled by your interests, and look askance at your attire. At least a geek can gloat at the notion of being smarter than regular folk. Take the Power of Two Digital Clock, for example. It speaks the little-known language of binary. The LEDs across its facade represent the exact hour and minutes of the day. A geek will have no problem mastering the clock's dialect. To everyone else, it remains the exclusive language of a highly-advanced people. We like that.

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XBOX

PlayStation.2

REMEDY™

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Gift Guide

SureFire A2 Aviator Flashlight

Sometimes a flashlight is just a flashlight, but geeks will agree that a SureFire flashlight is an object of lust. With its combination of old- and new-school technologies, SureFire's A2 Aviator satisfies a variety of urges. The 5.6-inch, 4-ounce flashlight features three LED bulbs that emit three lumens of light, perfect for peering into the deep recesses of a power-user's computer case. Apply a bit more pressure to its power button, and the A2 Aviator unleashes a potent 50-lumen saber. The A2 Aviator operates on two lithium batteries that can sit in place for 10 years (while you work things out in therapy). The LED bulbs will go strong for a good 15 hours, while the main bulb has a run time of approximately 60 minutes. It's the perfect torch for upgrading work.

www.surefire.com

$175

Corsair Micro XMS ProSeries RAM

Just when it seemed like there was nothing left to light up in a computer case, Corsair Micro introduced illuminated RAM. Offering the high performance that Corsair Micro's known for, each ProSeries module also features a set of nine LEDs along its spine. The red, yellow, and green lights perform a lively jig in time with your memory's activity level. A ProSeries module also features a unique cast-aluminum heatsink that's designed to increase the surface area and aid in cooling.

The modules come single or in matched pairs at speeds up to DDR400, and support overclocking up to 500MHz. What's next, a P4 that plays fiddle? **www.corsairmicro.com**

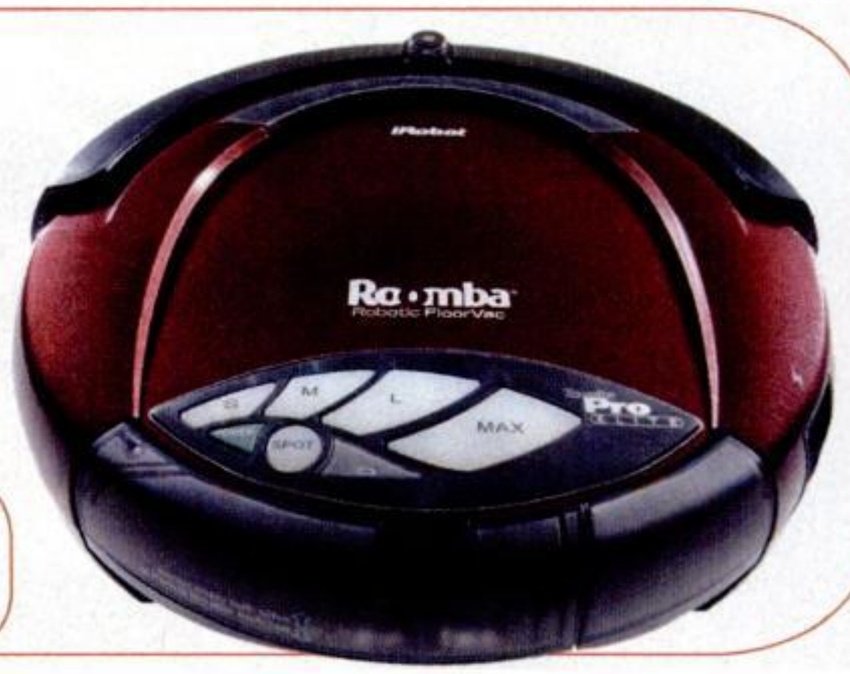
$310

iRobot Roomba Pro Elite Floorvac

So many editors have taken the Roomba home with them, the little bugger's getting quite a reputation. The details of these after-hours tête-à-têtes aren't entirely clear, but we know for a fact they involve vacuuming. Such is the Roomba's specialty.

You select the room size (small, medium, or large), clear the floor of obstructions, and then stand back while the battery-powered Roomba does its thing, crisscrossing the room in a systematic manner and sucking up anything in its path (imagine R2D2 flattened by a truck, but still totally able to get around, and really into tidiness). A non-marring bumper prevents walls and furniture from being harmed while the Roomba runs its sometimes-frenzied course. Even better, the Elite model comes with a remote control, allowing you more precise interaction with your appliance. And with the included wall-mount unit, the Roomba has a place to *hang out* between cleanings. **www.irobot.com**

$250



Compaq Slim iPaq Keyboard

It doesn't take a Nobel Laureate to figure out that handwriting-recognition on the PDA is only good for jotting down notes. Sure, there are a wide variety of full-size keyboards available for handhelds, but they usually require the support of a table (and how portable is *that*?). So explains our admiration for the Slim Keyboard for iPaq Pocket PCs.

Not to be confused with the clip-on PDA keyboard that HP also sells, the Slim Keyboard is part of a holster that your PDA slides into, making for a much more snug and stable fit. Thumb-typing action has never been easier.

www.hp.com

$50

Xbox Controller Adapter

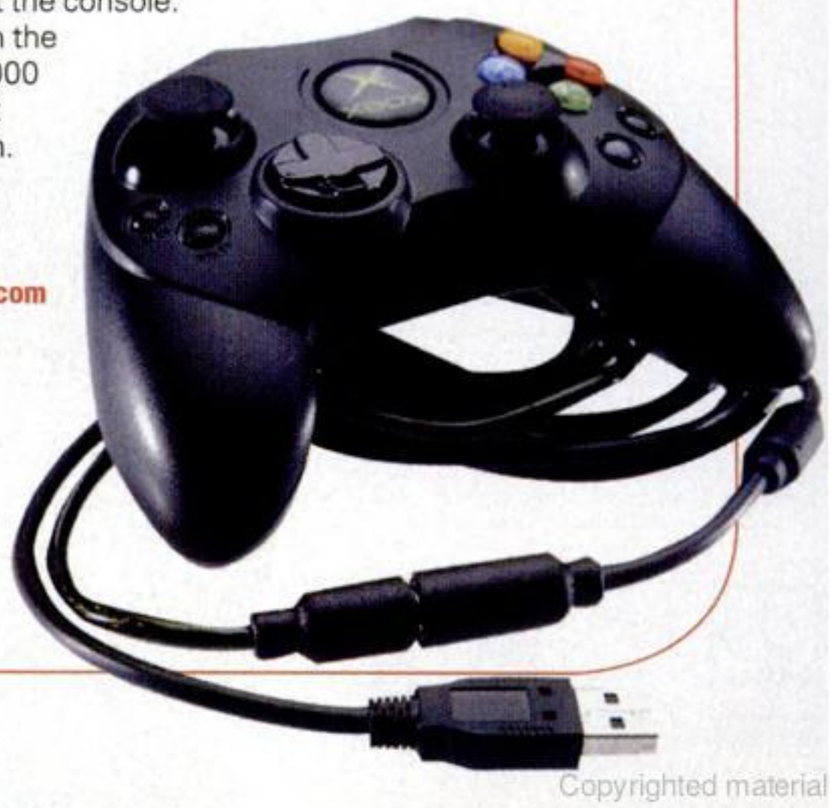
On the one hand, you have your Xbox. It comes equipped with a well-designed, extremely sturdy controller made specifically for Xbox games. On the other hand you have your trusty PC. You want to play Xbox ports on your computer, but the mouse and keyboard controls seem so inadequate. Enter the Xbox controller adapter. It lets you connect the Xbox console controller to your PC.

Sure, you could buy a gamepad designed for the PC, but you'd still be missing the fancy analog triggers and buttons that you've come to know and love about the console.

The adapter, along with the drivers for Windows 2000 and XP, can be found at Codeunderground.com. Liksang.com offers adapters for a variety of other consoles.

www.codeunderground.com

$12



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Gift Guide

KiSS DP-500 DVD Player

If anyone knows what's hot for the holidays, it's elves. And a recent raid on an unauthorized elf workshop several miles southeast of the North Pole revealed the most coveted item this season. In a dark warehouse littered with pointy shoes and green spangles, authorities discovered hundreds of DVD players from KiSS Technology. This is no ordinary progressive-scan DVD player, of course. It plays MPEG-4 compliant video, including DivX and Xvid booty gathered from the Internet, and even lets you turn your TV into an instant fun-maker with MP3 and OGG Vorbis support right out of the box. A built-in Ethernet port allows the player to hop onto your network and access media files directly from your PC, or access Internet radio stations in your living room. Naturally, the whole shebang is firmware upgradeable for future audio and video codecs. **www.kiss-technology.com**

$300

APC TravelPower Case

You know what we hate most about traveling these days? Not the interminable wait times in airports, or the perplexing security precautions at "historic landmarks." Heck, we don't even mind having our sneakers inspected for explosives. But, by Jove, if we aren't bothered by having to lug around multiple heavy power bricks for all our portable electronics.

Thank heavens for the TravelPower Case. It's a durable, stylish, and roomy satchel outfitted with a universal power brick and adapters for just about any modern-day laptop. It also includes a couple USB accessory ports, so you can simultaneously charge your laptop, cell phone, and PDA off a solitary power source. **www.apc.com**

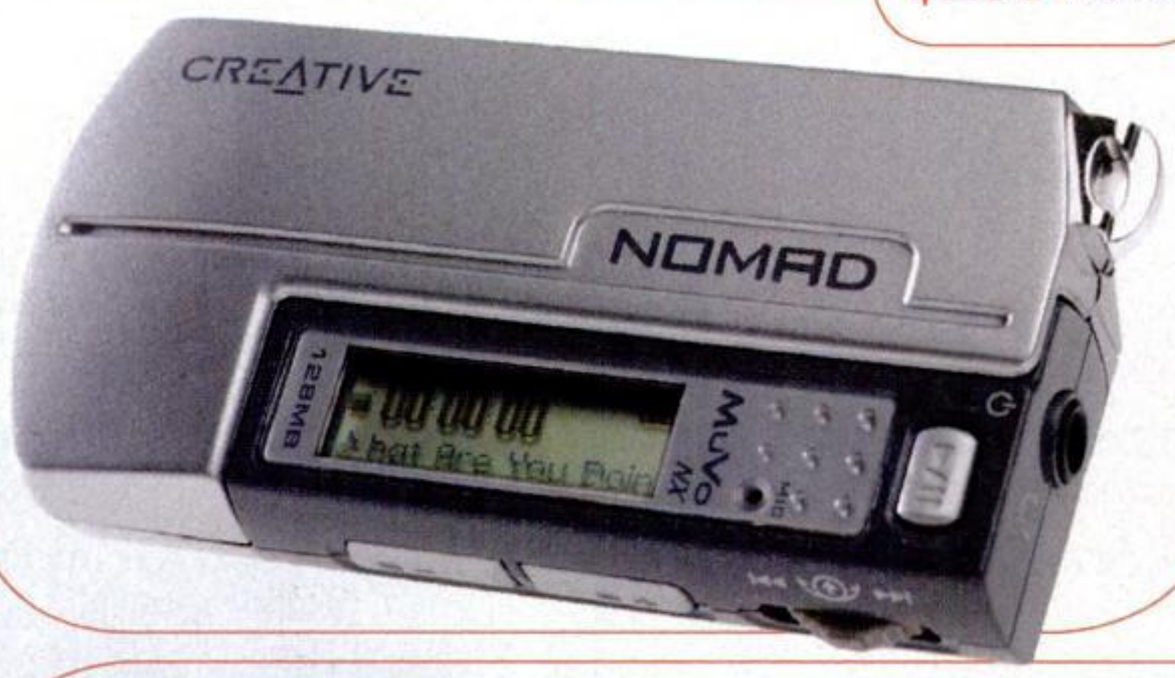
$35

Creative Labs MuVo NX

The original MuVo MP3 player and USB storage device just got an update, and our love for it has only blossomed. You can carry and listen to the Pixies' *Surfer Rosa* everywhere you go. You can connect to a USB port and enjoy downloaded Internet footage of some fat kid doing something he'll live to regret. And you can use the MuVo to record what someone else thinks is a private conversation for blackmail purposes.

Despite being just slightly larger than a Zippo lighter, the MuVo serves up MP3 playback, flash memory-based storage, and voice recording in a tiny, lightweight bauble that's sure to brighten the eyes of anyone with a music collection and a pulse. And now it even offers an LCD screen so you no longer have to play "Name That Tune" while scanning your tracks. **www.creativelabs.com**

$150 128GB
$200 256GB



Green Laser Pointer II

If the Green Laser were a superhero, he'd no doubt rule the roost. For one thing, he's way more powerful than his mischievous cousin, Red Laser.

Green Laser's able to emit 532nm of pure, unadulterated verdant light. Able to scale the tallest skyscrapers, no problem. Able to leap onto low-flying aircraft, and bound from cloud to cloud. And it goes without saying, Mean Green performs these feats at the speed of light. What's more, unlike his crimson kin, Green Laser's beam is clearly visible across the night sky. Which one would *you* rather put money on?

Let us make this perfectly clear: Green Laser is the absolute finest laser pointer we have ever used, and wherever we bring it, it becomes the life of the party. **www.thinkgeek.com**

$120

Garmin Rino 120

This is convergence we like. A two-way radio married to a GPS unit. Even better, when the waterproof Rino 120 is in FRS mode, you can transmit the coordinates of your position to fellow Rino users. Say you fall into a ravine or find a great deal at the world's largest outdoor computer show, the Rino will help you spread word to your posse and transmit a way-point to your whereabouts. The radio has 8MB of RAM, which can be used to store detailed street or topographic map information that you download from the PC. The radio supports both GMRS and FRS frequencies, the latter of which allows GPS positioning. **www.garmin.com**

$210

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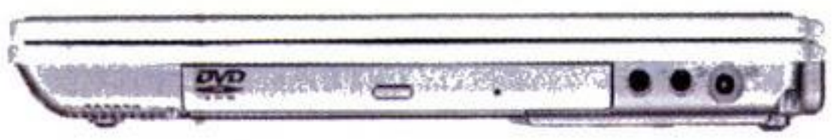
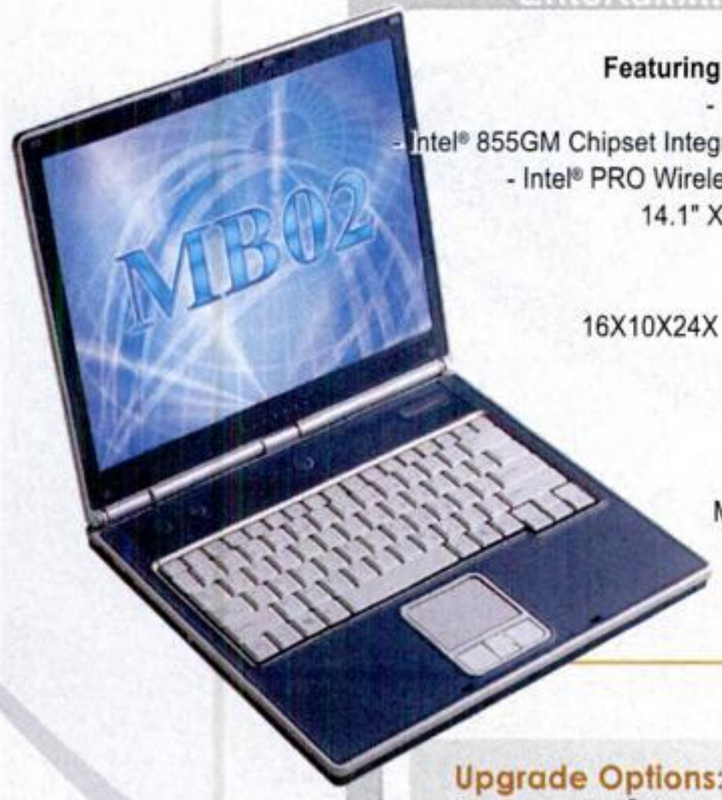


MOBILE TECHNOLOGY

SuperTalent™ DM-MB02-P

EntertainmentNOTEBOOK



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ExecutiveNOTEBOOK

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- Microsoft® Windows® XP Professional
- 5-hr Li-Ion Battery
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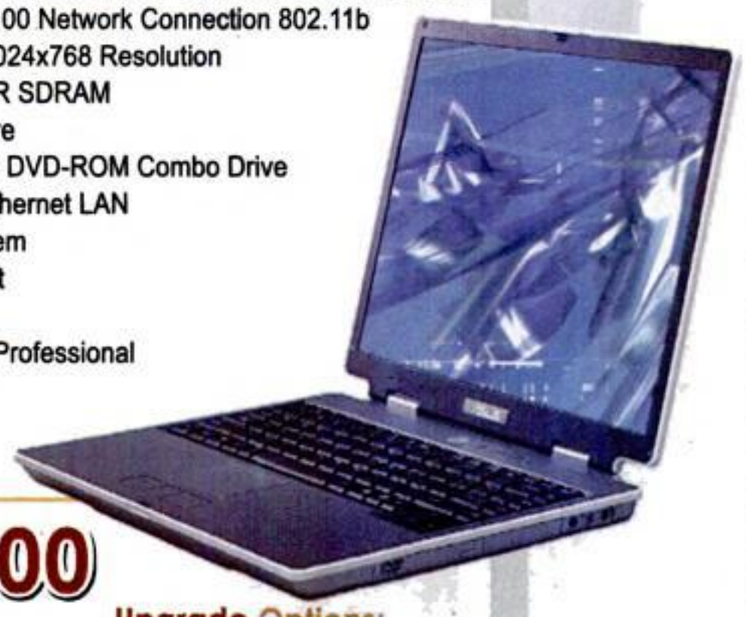
- 1-year Limited Warranty



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- **Software:** Microsoft® Office® XP Small Business/Professional
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Gift Guide

Ambient Orb Device

"Tell us, O Ambient Orb, what you seeth."

Actually, you don't have to press the Orb with a bunch of questions, because it reveals its information quite voluntarily, pulling data from a nationwide wireless network (no net connection is required).

Exactly what the Orb seeth can vary. Out of the box, it's programmed to track the health of the Dow Jones: When market prices are going up, the Orb shines with a blue/green light. When prices are going down, the light segues to red. At **www.ambientdevices.com**, you can select the focus of your Orb's careful watch. Shoot, you can even choose to monitor the weather or national security threat level, if that's your fancy. Once you see all the shades, hues, and blinking patterns the Orb can display, you'll understand that visual cues can speak volumes compared with "mere words." **www.thinkgeek.com**

$150

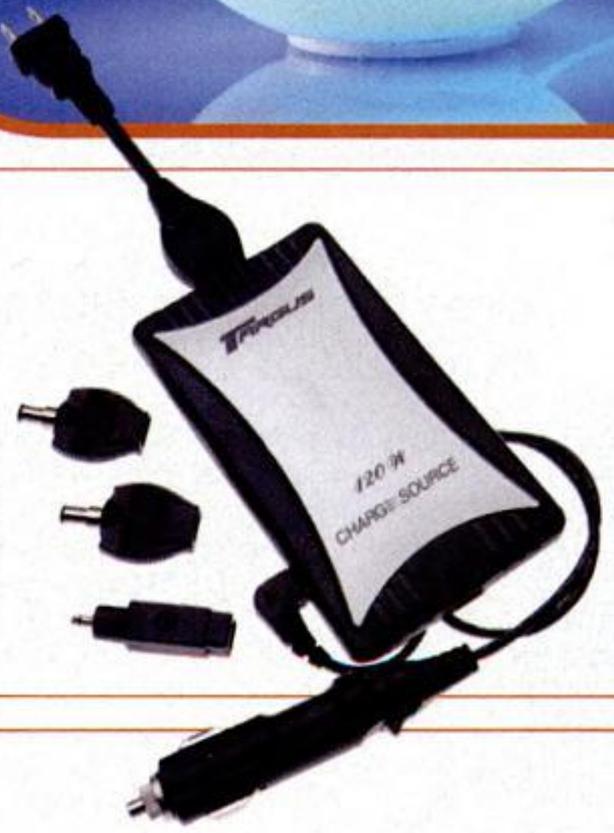
Charismac FireWire Dino

"ROAR!!!! MY NAME IS ZOLTOR, AND I WILL SWALLOW YOUR SOUL!!! RAWWWRRR"... OK, maybe that's a little overblown, but Charismac's FireWire Dino is nonetheless vicious looking. Four FireWire ports are interspersed among the razor-sharp plates that span the Dino's back (don't touch!). A power connection is nestled near the base of the Dino's murderous tail. When connected, the beast's eyes glow a fiery red, as if from the depths of Hades; meanwhile, the creature's gaping maw emits a menacing blue beam. Kneel before Zoltor! And while you're down there, plug in some FireWire devices and enjoy this fun addition to any desktop. **www.charismac.com**

$70

Targus 120-Watt Universal AC/DC Adapter

We'll spare you another spiel about the hassles of travel, and cut right to the chase: Whether you're taking a trip or just moving between home and office, a universal power supply will diminish your load considerably. Targus' new 120-watt universal power supply lets you power today's high-wattage notebooks as well as your PDA, cell phone, DV camera, and CD player (if you purchase the appropriate adapters), all with a slim, stylish, and proud-to-be-single power brick. The Universal supply supports 12-volt input from a car cigarette lighter or the in-air connectors on planes. It's the perfect gift for anyone with multiple gadgets. **www.targus.com**



$130

Radio Shack Pro-96 Digital Police Scanner

Sure, it's from the Shack, but you needn't turn your nose up at it. The Pro-96 digital police scanner is a seriously cool gadget. Essentially the first police scanner for the masses, the Pro-96 is able to monitor digital communications without the aid of an expensive decoder card. Furthermore, the radio runs on AA batteries instead of the proprietary packs required by competing units. Indeed, the Pro-96 is a veritable feast for the ears, with police, fire department, HAM, CB, and just about every other popular frequency at your disposal. The 500-channel scanner will interface with a PC for firmware updates and to download new frequencies to the unit (it comes pre-programmed for major metropolitan areas). **www.radioshack.com**

$500

Plantronics C212 2.4GHz Cordless Headset Telephone

You might feel all free and easy with your cordless telly and your ability to walk from room to room while carrying on a conversation. But you're really not. The necessity of a single hand, or worse yet, a shoulder, with which to cradle the phone's handset amounts to a body part that can't fully enjoy life.

Enter the Cordless Headset Telephone. The phone's dial pad is just a slip of thing that can be easily attached to your belt buckle or tucked into a shirt pocket. The headset, or earpiece (the parts are convertible), is lightweight, cushioned, and imminently comfortable. Add to that the phone's healthy range, noise-canceling mouthpiece, and cell phone-caliber functionality, and, folks, there ain't no livin' you can't do during a phone call. **www.plantronics.com**

$180

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Nerdy: It's the new nice.

Digital Blue QX3+ Computer Microscope

You needn't be a pre-teen to appreciate the fun and wonder of the colorful QX3+ microscope. All that's required is a PC with a free USB port and an Alpha Geek's desire to look at things really, really close up. Be it a strand of hair or a strain of deadly virus, your magnified object gets displayed on your computer screen in all its glory. A slew of effects and editing tools gives you license to tamper with the results. The QX3+ can even be removed from its base, so your adventures in magnification aren't confined to the sample platform.

Hey, if it's good enough for the Raelians, it's good enough for us.

www.thinkgeek.com

$55

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Ask the Doctor

Symptom ▶ Diagnosis ▶ Cure

IS MY ROUTER A FIREWALL?

I have just installed a Linksys four-port router connected to my cable modem. The Linksys router model BEFSR41 claims to act as a firewall of sorts. It includes the ability to block all anonymous Internet requests. How safe and functional is the integrated security of the Linksys router? Do I need to install separate firewall software such as *ZoneAlarm*?

—DENNIS JACKSON

Most home routers work by using network address translation (NAT), in which a single Internet address is shared among several computers on your home LAN. NAT is inherently secure, because it won't forward any unsolicited incoming packets from the Internet to your LAN. Some routers, including the model you mentioned, allow you to push all unsolicited incoming packets to one of your private internal IP addresses. This is great if you want to host a small web site at home, but it's a real problem when worms start blasting every device connected to the Internet. The solution is to either disable the IP forwarding, or to set up a software firewall (like *ZoneAlarm*) on the machine that you forward incoming packets to.

Another problem is that the Linksys firewalls are now so ubiquitous that people are actually writing malicious programs that attack the routers. You can avoid an attack by keeping your router's firmware current. You could also set up a separate firewall between the router and the cable modem, but that's probably unnecessary.

SPYWARE STRIKES AGAIN!

I'm sick and tired of having to reset my Internet home page every day. I like it set to Yahoo because that's where my e-mail account is, and every day the home page resets to a site called Global-Finder. I can't get it to stop doing this. I've scanned my hard drive for viruses, but to no avail. I've gotten so desperate as to even consider reformatting my hard drive. Please help me.

—LUIS TENORIO

It appears your machine is infested with spyware. The ware in question is *CoolWWWSearch*—a small program that runs every time you boot your PC. Every time the program runs, it changes your home page and bookmarks, and creates pop-up ads for web sites that don't have pop-ups. We can see how it would annoy you.

The best way to rid yourself of *CoolWWWSearch* is to download a handy little utility called *CWShredder*. You can get it at www.spywareinfo.com/~merijn/files/cwshredder.zip.

TEMPLATES GONE WILD

I'm running *Microsoft Office 2000* in Windows 98. About a year ago, I pasted an e-mail message into *Word* to print and save it. Now whenever I open *Word* that message appears. Whenever I open a blank document the message appears. I have deleted Document1 and the message still appears. I have deleted the text and saved the empty document, and the text still appears. Searching for the text indicates it can be found in User.dat, Rbbad.cab, and Normal.dot. How do I get rid of the text so that a new blank document is really blank?

—RICH38

It sounds like you accidentally saved your pasted e-mail to the default *Word* template. To fix it, all you need to do is find normal.dot using the Windows search tool, remove the offending text, and then save normal.dot. The next time you open a new *Word* document, it will be blank, exactly as you'd expect.

Power users can take this one step further. We use a specific template for all our documents at *Maximum PC*, so several of the editors have changed their normal.dot file to match that template. It saves a few seconds every time someone creates a new file.

WHO'S BOSS, SERIAL OR PARALLEL?

I recently read in your magazine that you can run both Serial ATA and parallel ATA hard drives in a system. If you have one SATA drive and one parallel ATA drive on the primary master controller, who's the boss? On which one should I install the OS?

—GARTH FRANCE

The Doc recommends that you install Windows and your frequently used apps on your fastest hard drive. Then install the stuff you don't use as often, like MP3 files, digital photos, and less-used games to your slower drive.

Now, don't confuse your drive's speed with its interface type. For the most part, Serial ATA drives are faster than parallel ATA drives;

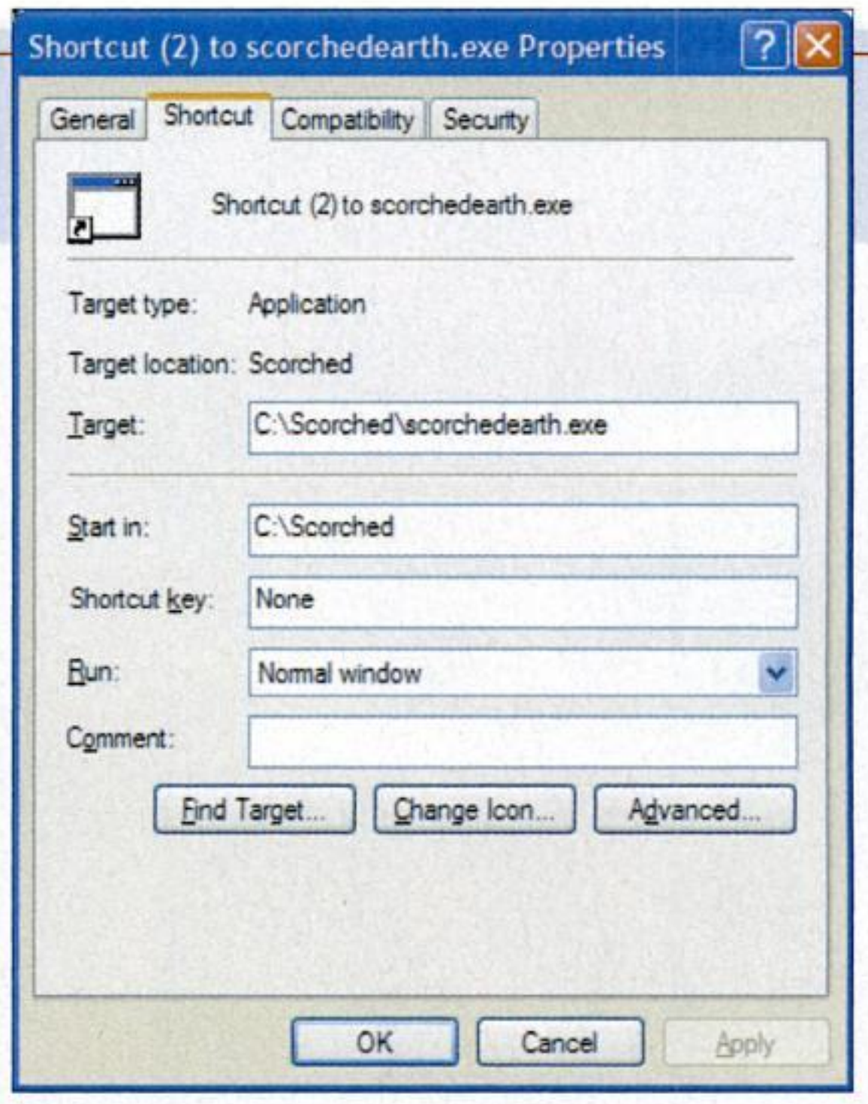
continued on next page

I'M PIF'D!

I have a question about a DOS game I'm having trouble getting to work. The game is *Scorched Earth*, which is an old DOS game. I'm having trouble running it in a DOS window through Windows. The program reports this error: "invalid startup directory, please check your pif file." Is there any way you can help me with this? Thanks.

—SOUTHERNFENIX

"Invalid startup directory" means you need to fill in one or more fields on the PIF window. Make sure the "Start-in" field in the shortcut's Properties window points to the same directory the executable is in.



If your DOS shortcuts are complaining about "Invalid startup directories," make sure the Start-in section of the shortcut's Properties tab is filled in.

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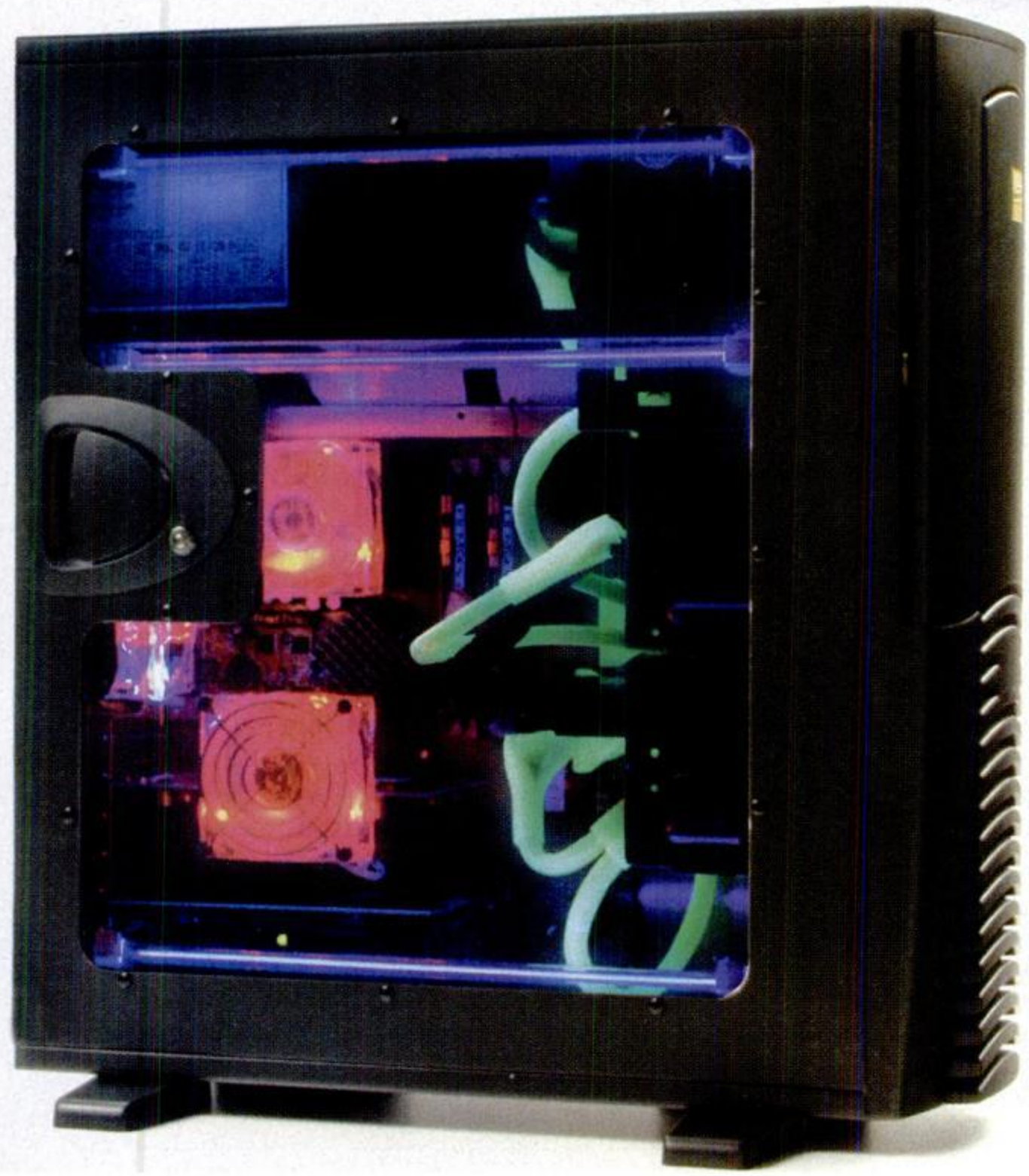

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11700 3DMark2001 Score

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- 512MB DDR SDRAM (PC2700 333MHz) 1.5GB Max
- 80GB **Western Digital** 7200 RPM Ultra ATA/100 Hard Drive
- **Samsung** DVD/CDRW Combo 16X48X24X48X Drive w/software
- 128 MB **GeForce FX** 5600
- **USB Version 2.0**
- **Pro 100** Network card
- 56K **US Robotics** V.90 Data/Fax Modem
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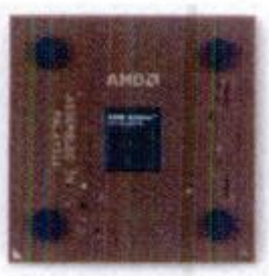

AMD Athlon™ XP

The way it's meant to be played. nVIDIA GeForce FX

Ridiculously Insane
18000 3DMark2001 Score

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- AMD Athlon™ XP processor 3200+ with QuantiSpeed™ architecture
- 1.0GB DDR400 (PC3200) 4GB Max
- Dual 120GB **Western Digital** 7200 RPM Ultra ATA/100 Hard Drive
- **Pioneer** A06 DVD-R/RW
- **Lite-On** 52X24X52x CDRW Drive w/Nero Burning Software
- 256MB DDR SDRAM **nVidia GeForce** FX5900
- **Ultra AGP** 8X Video Card
- **Creative Labs** Sound Blaster Audigy2 Sound Card
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AUDIO AGGRAVATION

My PC's audio suddenly began to sound horribly distorted, but only in certain circumstances. For example, the audio in the introductory screens of games sounds like it's coming out of a garbage disposal, but the audio for the game itself is fine. I can play back DVDs without any problem, but downloaded trailers are unlistenable. I didn't install anything new. I don't think I've installed anything at all for a while. I'm using Windows XP.

My soundcard is a Creative Labs Audigy (the original, not the Audigy 2). I've tried adjusting the levels in my mixer, but the result is always the same. The volume lowers, but the distortion remains exactly the same. I'm going crazy trying to figure out what's wrong!

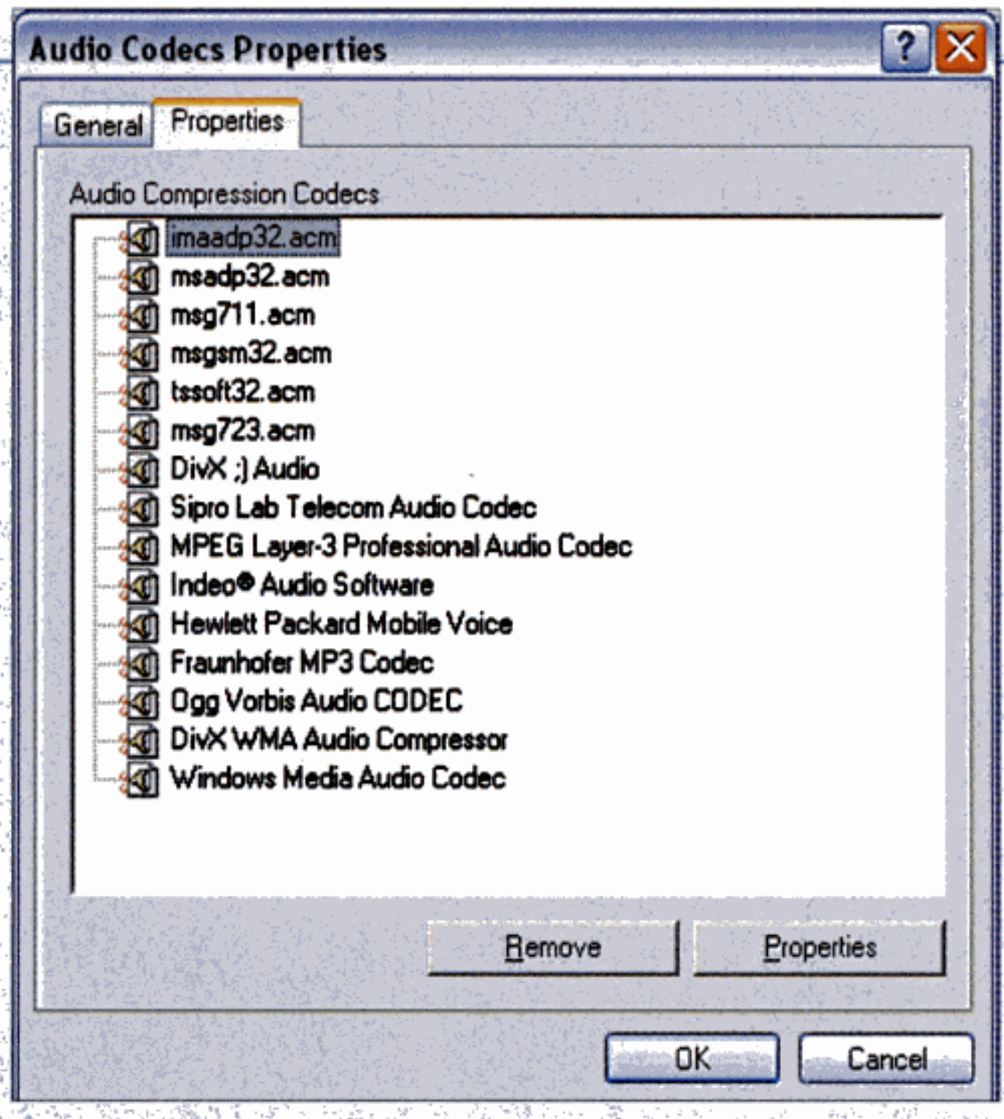
—HIRO KIKOSHIMA

Because DVD audio is fine and game audio doesn't come off sounding like Einstürzende Neubaten, the problem isn't with your hardware. With that possibility eliminated, we look to the fact that compressed video (such as introductory game video) and downloaded movies don't sound right. It sounds like you have a bad audio codec.

A codec (short for encoder/decoder) compresses audio and/or video so it will fit in a smaller space. Windows Media Video 9 is an example of a video codec, while MP3 is an example of an audio codec. These codecs can often be mixed and matched; so a video might use the popular maverick Xvid codec in combination with the MP3 codec for audio and an AC3 filter for Surround Sound. If one or more of these codecs becomes corrupted, you'll get poor sound, poor video, or no sound or video at all.

Here's how to root out the offender in Windows XP. Right-click My Computer, select Properties, click the Hardware tab, and then click Device Manager. Within Device Manager, click the plus sign next to "Sound, video, and game controllers," double-click "Audio Codecs," and select the Properties tab. You'll see all the codecs installed in your system. Starting from the top, double-click each codec, and you'll get a dialog box that allows you to disable the codec. Disable it, and test your sound with a file you know to trigger distortion. If that doesn't solve the problem, re-enable the codec, and target the next one in line. Keep going until you've pinpointed the culpable codec. Once you've disabled the bad codec, write down its name, and then try your test file again. Your sound may work fine. If your media player, however, says it can't find the right codec, enter the codec name in Google and find another source for a new or updated version of the same codec.

In the future, be especially wary of codec "packs" offered on the web and USENET that promise to install current versions of all the codecs you need for media playback. The included codecs may be buggy, or worse yet, may even contain malicious code.



Device Manager allows you to prioritize, selectively disable, or adjust the settings for each of the audio codecs on your system.

however, speed ultimately depends on the spindle speed of the drive and the size and type of disk cache.

Your motherboard's BIOS should have a setting to control the boot order between the parallel and Serial controllers. Check your mobo's documentation for the full scoop on your particular board.

HTML DESKTOP SNAG

I HTMLified my Desktop using the instructions in the July 2003 How To, but I've hit a snag. I couldn't figure out how to make the HTML links that I saved on my Desktop directly open programs. Can you please tell me how to do it, if it's even possible?

—ZACHARY GLAZER

Well, Zachary, you've hit the same snag we did when working on the How To. Try as we might, we couldn't get a program to actually run from a link on our Desktop. If we pointed the link to an executable, we got just the download prompt. If any readers have suggestions, shoot an e-mail to doctor@maximumpc.com with the deets.

When you're down, and troubled, and you need a helping hand, and nothing, whoa nothing is going right with your PC, fire off an e-mail to the Doc. He'll come a-running to fix that PC problem right up. The address is **doctor@maximumpc.com.** Unfortunately, due to the volume of e-mail he receives, he can't respond to everyone. Make sure to include your full name and phone number!

MYSTERIOUS DURON MEMORY

I have a main board with a Duron processor marked "tmf m21 94v-o." That's the only identifier on the board aside from a logo (triangular with circles inside). It has a 128MB memory chip in it, and I'd like to upgrade to another 128MB. I don't have the manual, nor can I find the manufacturer on the web. I wonder if you might have any idea who the maker is, where I can find the manual, or how I can identify the type of memory I have so I can buy another stick.

—SEAN TYSON

You haven't given the Doctor much to go on. "TMF M21 94V-0" seems reminiscent of an old 486 motherboard, but that's impossible if you have an AMD Duron processor. So, given the dearth of information, the Doctor suggests that you examine the memory. There are two possibilities: either you have PC100/PC133 SDRAM or DDR200/DDR266 RAM. Pull the module out of the slot and look at the edge that plugs into the motherboard. If it has two physical cuts (keys) in it, it's SDRAM. If it has only one cut, it's DDR. The Doc recommends buying another 128MB or 256MB stick of RAM. Don't get greedy and buy a 512MB piece of RAM, because there's a chance your old motherboard may not support it.

continued on next page

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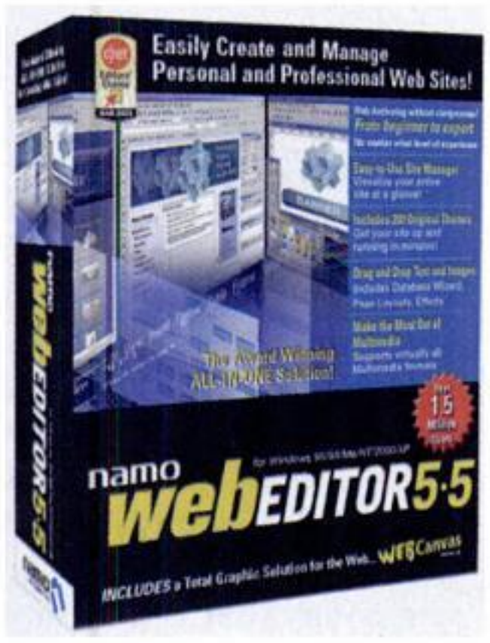

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YOUR ENTERTAINMENT PC QUESTIONS... ANSWERED!

Last month's story explaining how to build the ultimate entertainment center PC generated a deluge of reader questions. We picked the best queries and handed them to the Doctor to see what he had to say.

GOING THROUGH THE PROPER CHANNELS

I've got a satellite receiver, what can I use to change the channels on it?

—JULIUS CORNWALIS

To get the most from your entertainment rig, you'll need it to talk to your satellite receiver or cable box. If you don't, you'll be unable to record all the cool programming you're paying for. The solution is an IR blaster.

An IR blaster is a small USB or serial device that mimics the remote control for your satellite dish or cable box. After you configure the IR blaster with the specifics of your hardware, it can change the channel on your satellite dish or cable box at will, and fulfill your PVR destiny.

ATI says it will have a Multimedia Center-compatible IR blaster ready by the end of this year, but you can buy one right now that will work with *Personal Video Station 3* from Snapstream's online store (www.snapstream.com).

MAKING CONNECTIONS

Which types of connections are the best for home theater video and audio?

—WILLIAM TARANTINO

Use the most PC-like connections you can muster. We recommend an analog DB-15 connection for your monitor, if at all possible. We have seen some HDTVs that include a DB-15 connector but don't actually support PC resolutions above 640x480, so read your manual to find out what your TV supports. If your display doesn't have a PC monitor connector, you'll need to either get a videocard that outputs HD resolutions or an HD adaptor for your current card. At press time, only ATI cards actually work with HD adapters, so nVidia-philes are out of luck.

On the sound front, analog is best if you intend to play any PC games at all. Most soundcards (the nForce 2's onboard sound is the one exception) only output stereo PCM signals through their digital connectors. The analog connectors are the only way to get 5.1 positional audio on most machines. If you happen to have an nForce 2 motherboard, feel free to go fully digital. You won't be disappointed.

A LITTLE DEMO'LL DO YA

What are some good DVDs for showing off my system to my friends? What about games?

—FRANK SMITH

We have a few DVDs we keep around for the sole purpose of testing a sound rig or huge display. For instance, Chapter 26 of the movie *Drumline* features some exceptional positional sound. *The Two Towers* also offers reference quality sound. Be sure to listen to the chapter with the battle for Helm's Deep, when orc and elf arrows alike will seem to whiz all around you.

Games can also make great demos for your entertainment system. We recommend firing up a multiplayer first-person shooter and diving into the online combat. Any game that supports DirectSound3D should sound great on your rig. *Unreal Tournament 2004*, *Planetside*, *Battlefield 1942*, and *Call of Duty* will all make your surround system thump.

BURNING VIDEO TO DVD

How should I encode my video to ensure it works on a set-top DVD player?

—BENJAMIN DOYLE

It's easy. Open *Snapstream* and go to the web admin. Click on Recording Preferences and change the Recording File Format to "MPEG-2" and the Default Quality to "NTSC DVD Ready Hi-Res." If you do that, *Easy CD Creator* will be able to use the video files for a video DVD without having to transcode them.

EXTERNAL SPACE SAVERS

Can I use an external hard drive to add more storage space?

—JASMINE NGUYEN

Definitely! USB 2.0 and FireWire external drives are more than fast enough for PVR or MP3 duties. An external drive isn't ideal for installed games, for speed reasons, but it'll work in a pinch.

One of the benefits of using an external drive is that you can minimize noise by hiding the drive away from your main PC using a long connector cable. Just remember to back up your external drive frequently. We've found that external drives have a significantly shorter life span than internal drives.

SILENCE YOUR SYSTEM

How can I make my system quieter?

—LEONARD NIELAND

Making your system quieter is really the subject of another story, but we have a few guidelines. First, use the power management Control Panel to disable your hard drives after five or 10 minutes of inactivity. Loud hard drives are one of the leading sources of noise in today's PCs.

Another source of noise is fans. Most Shuttle boxes have just one or two fans, which is one reason we're so fond of them. We're reticent to recommend that you tweak Shuttle's existing fans, since most of the mini boxes are carefully engineered to defend against the heat generated by the system components, but you can help muffle the noise the wee PCs do make. First, add a filter between the front intakes and the bezel. The filter needn't be anything fancy. A piece of cut filter from a central-air and heating system will work perfectly. Second, apply Dynamat or another low-profile sound-absorbing material to the inside of the case lid. Make sure you don't cover any air holes, and that the case will still close before you permanently affix the Dynamat. It's notoriously difficult to remove.

SPEAKERS SIMPLY DON'T WORK

My rear speakers aren't working. How can I get them up and running?

—LEAH SMITH

There are two places in most systems that control the number of speakers your system has connected: In your soundcard's control panel, and in Windows' "Sounds and Audio Devices." Make sure the information in both areas matches up, and that it accurately represents the number of speakers you have connected to your PC.

If you're having trouble getting 5.1 sound from your DVD movies, you might need to configure your DVD software. In Multimedia Center, you'll need to go to the Settings menu and then the Audio tab, where you should select the proper speaker config.

EVERYTHING BUT THE NFORCE2

I'm not using an nForce2 motherboard. Is there anything I need to do differently?

—MARTY ATKINS

If you're using a motherboard with another chipset, you'll probably want to replace the crappy onboard sound with a higher-quality product. The Audigy 2 series from Creative Labs produces great sound, has low CPU utilization, and won't empty your wallet. Remember, there's no need to shell out for the expensive Platinum edition because you don't have a free 5.25-inch bay for the breakout box!

ALL-IN-WONDER AIN'T FOR ME

I'm using a stand-alone TV tuner. Do I need to do anything differently?

—DILLON CAWOOD

If you decide to use a separate TV tuner instead of an integrated card, like the All-in-Wonder, you need to do two things: Pipe the sound to your soundcard, and make sure your card is compatible with *Snapstream*. Some tuner cards can pass an audio stream across the PCI bus, but most need an analog audio connection to the soundcard.

CONNECTING WITHOUT A MONITOR CABLE

My HDTV doesn't have a DB-15 input. What do I need to get a high-resolution image?

—NORAH TEPPER

If you're using an ATI All-in-Wonder card, all you need is the little red adapter cable that came in the box. All newer ATI boards without tuners, from the Radeon 8500 on, can take advantage of adapters to output their signals to HDTV sets. nVidia users are outta luck. There's no word about HDTV adapters for any nVidia boards. ■

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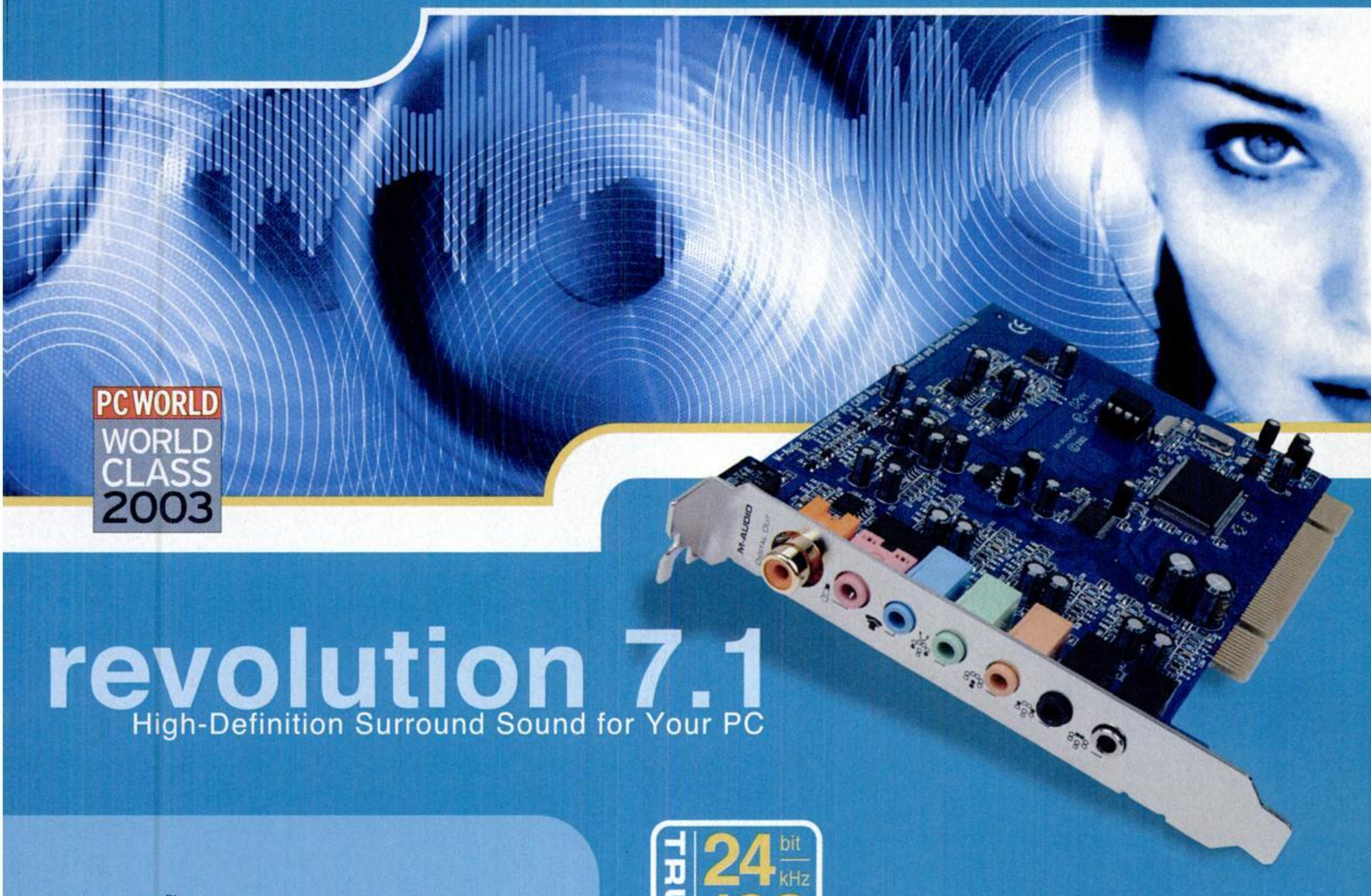

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GET THE MOST FROM WIN XP

Tweak everything about Windows XP, from your boot time to your Start menu

MAXIMUM PC
TIME TO COMPLETION
00:40
HOURS MINUTES

BY WILL SMITH

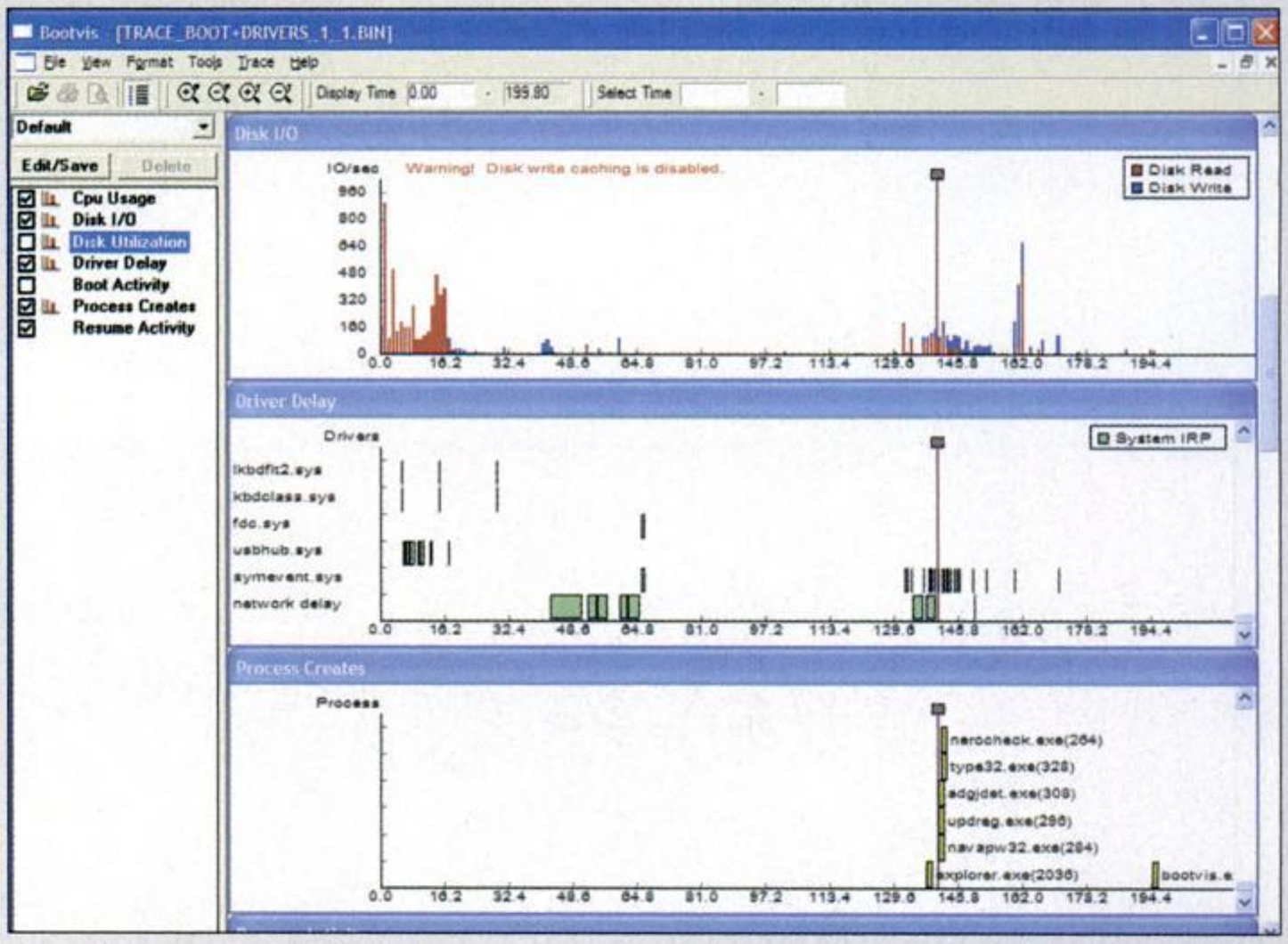
Even though Windows XP is the best operating system Microsoft has ever shipped, it can still benefit from a bit of tweaking. Whether you're trying to speed up system performance, conserve a few gigs of hard disk space, or just add a handy new feature to the interface, a fine adjustment here or there can make a world of difference.

Submitted for your approval, we give you our 13 favorite WinXP tips and tricks.

Improve Your Boot Speed

A handy little app called *Bootvis* is available on the Microsoft web site—search for "bootvis" at **www.microsoft.com**. The software analyzes your PC's boot process and checks for slow-starting drivers, apps, and even OS components. If all you want to do is make your PC boot faster, download *Bootvis* and run the program. Then go to Trace, then Optimize. If you want to see how much faster your PC is after *Bootvis* has done its job, go to Trace, Next boot + Driver Delays.

Bootvis will restart your system and monitor the way each driver and TSR loads, then it will optimize their positions on your hard drive. This will allow your drive to feed your OS with information as quickly as possible, and should significantly shorten boot times.



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Switch Tasks a Whole New Way

Pressing Alt+Tab is the quickest way to change between different windows, but how do you know which of the five *Internet Explorer* windows is the one you really want? If you're using the Alt-Tab Replacement Power Toy from Microsoft, it's easy. Instead of seeing the application's icon in the Alt-Tab window, you see an actual image of the app that you're switching to. Very cool.

Head to **www.microsoft.com** and search for "Windows XP PowerToys." You should find a page with 10 separate Power Toy installers. Grab the Alt-Tab replacement, install it, and alt-tab your way to a new life.

Run Command-Line Apps Fast, Fast, Fast

If you frequently run command-line applications, you'll want to know the Address bar's dirty little secret: Not only does the Taskbar's Address bar give you a quick way to launch your favorite web sites, but you can also run applications by typing the program's name into the Address bar.

Putting the Address bar onto the Taskbar is as easy as right-clicking the Taskbar, going to Toolbars, and selecting Address. You can drag the bar to an empty, convenient place on your Taskbar, where it will live forever.

Don't know what to type to open your program? It's easy to find out. Right-click on the shortcut you use to open the program, go to Properties, and look in the Target box. All you need is the app's name, which usually ends with .exe, .com, or possibly .bat.

Shortcuts, Shortcuts Everywhere

WinXP includes literally hundreds of handy keyboard shortcuts, but we bet you don't know about the Windows key shortcuts that make the 104th key on your keyboard worth fooling with.

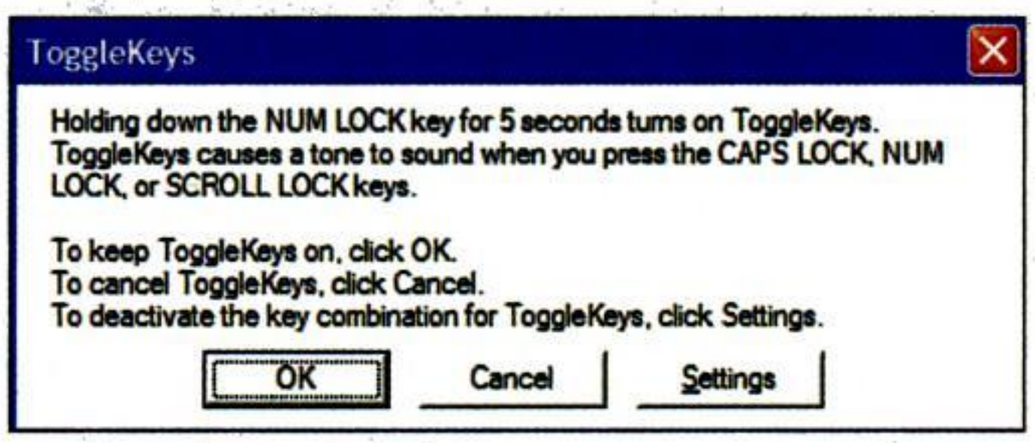
- Windows key + Pause/Break: Opens System Properties
- Windows key + l: Locks your workstation
- Windows key + d: Minimizes all windows
- Windows key + e: Opens Windows Explorer
- Windows key + r: Opens the Run dialog
- Windows key + f: Opens the Search Window

Optimize Your Disks at Will

One of WinXP's best tricks is that it places commonly used files on the faster sections of your hard drive to minimize load times. The catch is that it does this only every three days. If you want to kick-start the operation, go to the Start menu, then choose Run, and type `Rundll32.exe advapi32.dll,ProcessIdleTasks`. You should see some hard drive activity as your apps are rearranged on your platters.

Save Yourself from ALL CAPS Accidents

Writing in ALL CAPS is the written equivalent of screaming at the top of your lungs. If you accidentally press the CapsLock key, you can inadvertently scream at whomever you're e-mailing. To avoid this unintentional faux pas, hold down the NumLock key for five seconds to enable ToggleLock. ToggleLock is a handy, dandy built-in Windows feature that makes your PC beep whenever you toggle CapsLock, NumLock, or Scroll Lock on or off. NOW YOU HAVE NO EXCUSE FOR YELLING AT PEOPLE!



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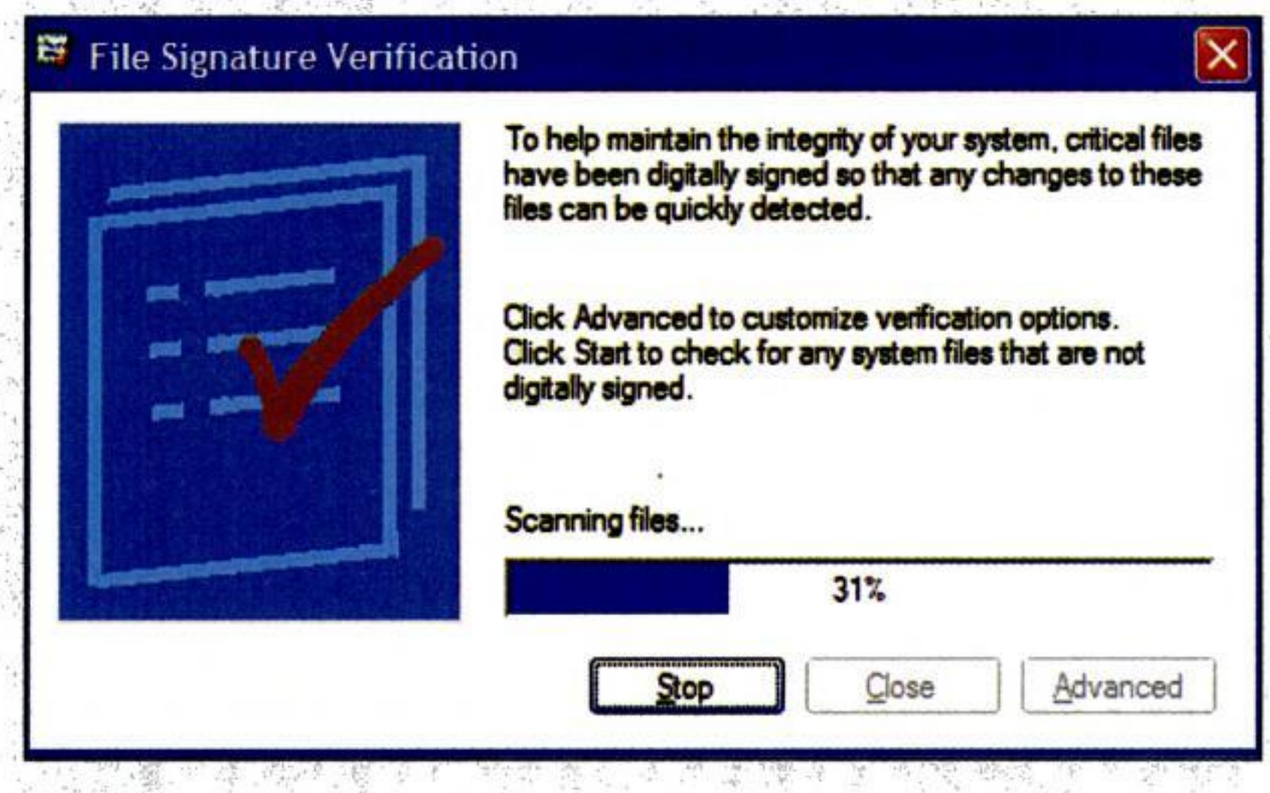
Check for Signed Drivers

If it were up to the programming wizards at Microsoft, the entire world would run signed drivers. You see, a significant number of crashes and system errors can be traced back to broken drivers. But signed drivers have passed through the Microsoft Hardware Qualification Labs and should be more reliable and robust than unsigned drivers.

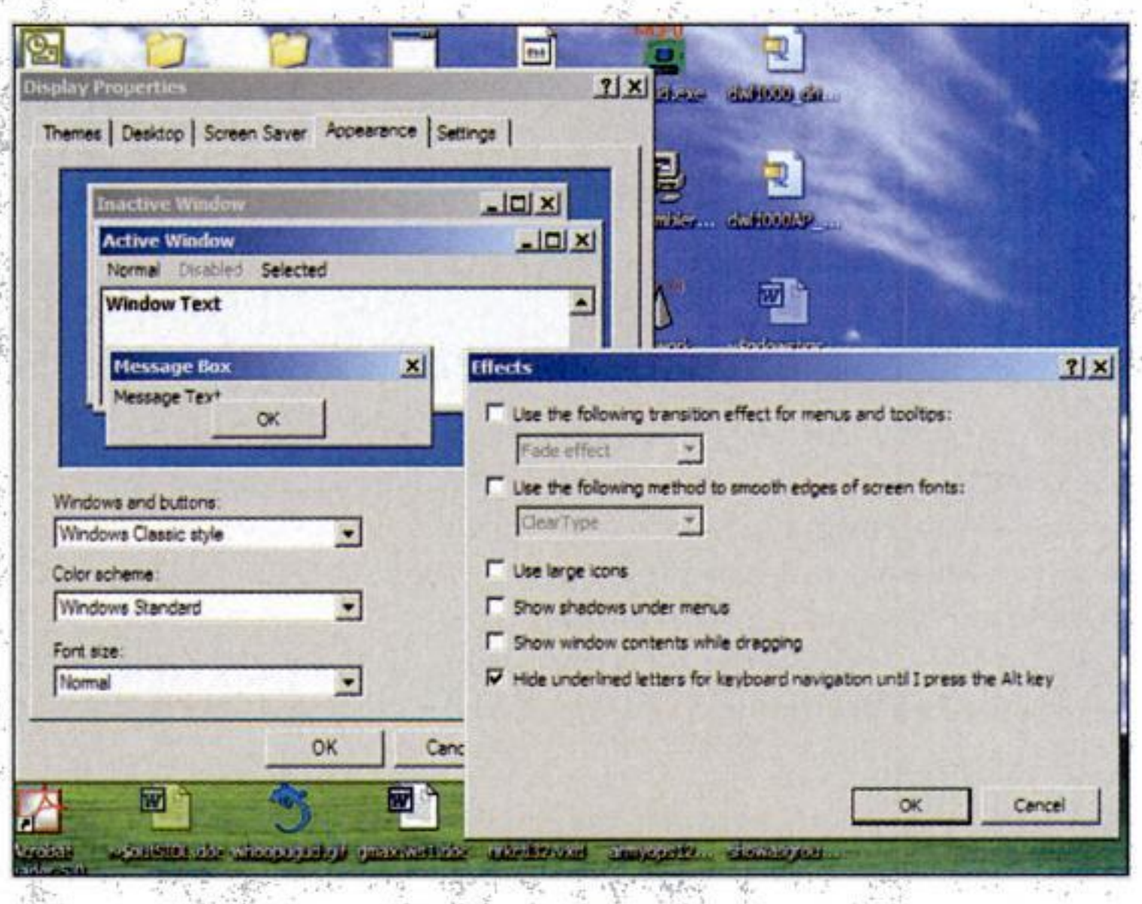
If your machine is crashing, and Windows is blaming it on a problem driver, go to the Run program under your Start menu, and fire up `sigverif.exe` to scan your system for unsigned drivers and other system files. Now visit your hardware manufacturers' web sites to find more up-to-date and signed versions of the drivers. Remember: Signed drivers are better, but unsigned drivers aren't necessarily bad, especially those that are updated frequently, like videocard drivers.



Speed Up the Interface

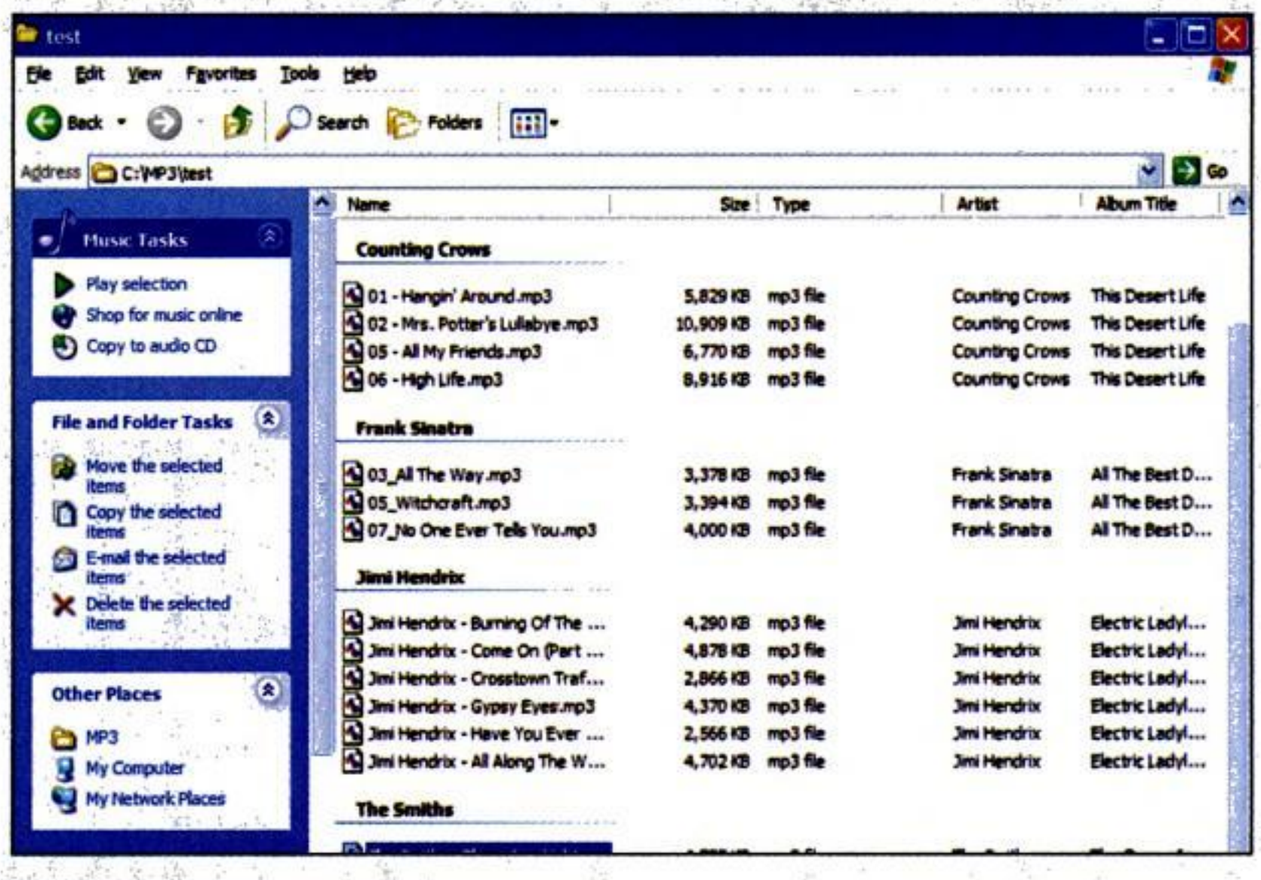
We think WinXP's new interface is great, but we also run the latest hardware, so our machines easily fulfill the operating system's performance requirements. If the new Luna UI has got your older machine chugging along at 486 speeds, there are a few things you can do to pick up the pace.

First, go to the Display Properties Control Panel (right-click an empty spot on your Desktop and choose Properties). Now choose the Appearance tab and click the Effects button. Uncheck the following: "Use the following transition effect for menus and tooltips," "Use the following method to smooth edges of screen fonts," "Show shadows under menus," and "Show window contents while dragging." If this doesn't speed up things enough, you can turn off the special user interface altogether by selecting "Windows Classic Style" from the Windows and Buttons menu on the Appearance tab. In the Lab, this has given us 5 to 10 percent faster scores in *SYSmark*.



A New Way to Look at Your Files

If you have a big folder full of images from your digital camera, or unsorted MP3s, the "Show in Groups" folder option might be useful to you. It allows you to group your files in the Explorer window into similar categories instead of just listing them in the order you specify in the "Arrange by" menu. If you want to use Show in Groups to organize shots you took with your digital camera, choose Arrange by Modified to sort your snaps based on the day they were shot, then check "Show in groups" to group them by day. It's also convenient for music: Use Arrange by Artist with Show in Groups to group songs by the same artist together, or Arrange by Album to group songs from the same platter.



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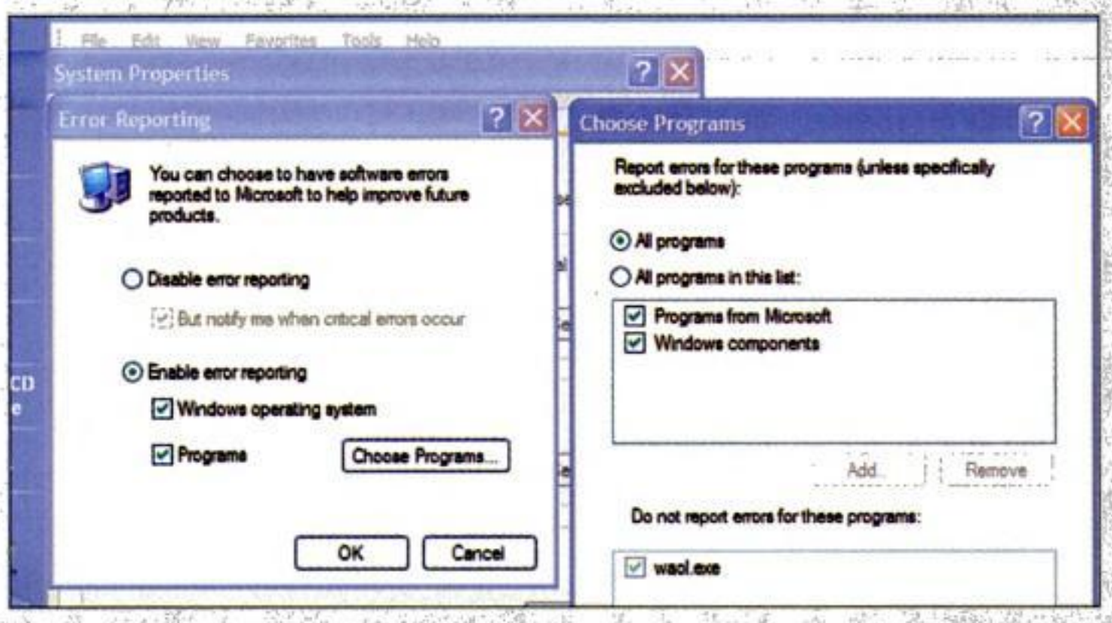
Take Control of Windows Error Reporting



Sure, it's great to help Microsoft track down bugs inside Windows and applications, but when you're in a hurry to print something and an unruly app keeps crashing and generating those annoying error-report messages, you don't care about helping Gates and his bully boys. You can turn off error reporting entirely by going to System Properties (Windows key + Pause/Break), clicking the Advanced tab, then clicking the Error Reporting button.

You can either disable error reporting entirely by selecting that option, or you can zoom to the "Choose Programs" screen and specifically choose the apps you want to include or exclude from the error-reporting process.

Explorer Crashes Got You Down?

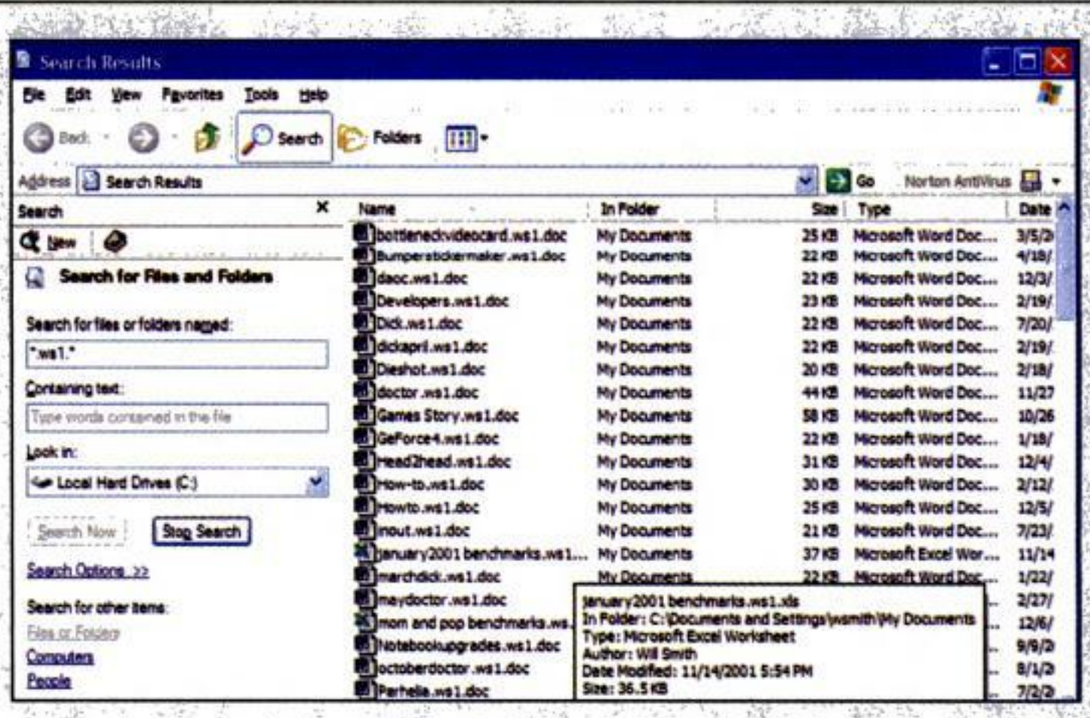
If you're sick of a single Windows Explorer window crashing and then bringing down the rest of your OS with it, follow this tip: Open My Computer, go to Tools, then Folder Options. Click on the View tab, then scroll down to "Launch folder windows in a separate process" and enable this option. Just be aware that you'll have to reboot your machine for this tip to take effect.

Now, if Explorer does crash on you, taking your Taskbar and Start menu with it, it's easy to get them back. Just press Control + Alt + Delete. Then File, then New Task, and type `explorer.exe` to start a fresh version of your shell.

Reject the New Dumb Search Interface

Do you miss the simplicity of the old Windows 98/2000 search utility? Does it make you angry that Windows XP dumbed down your search options and gave you a bothersome Search mascot? We'll show you how to not only ditch the mascot, but also revert to the original, more powerful search interface.

Open Regedit by going to Start, Run, and typing Regedit in the Open box. Then browse to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\CabinetState\ and create a new String Value called "Use Search Asst," and set the value to "no".

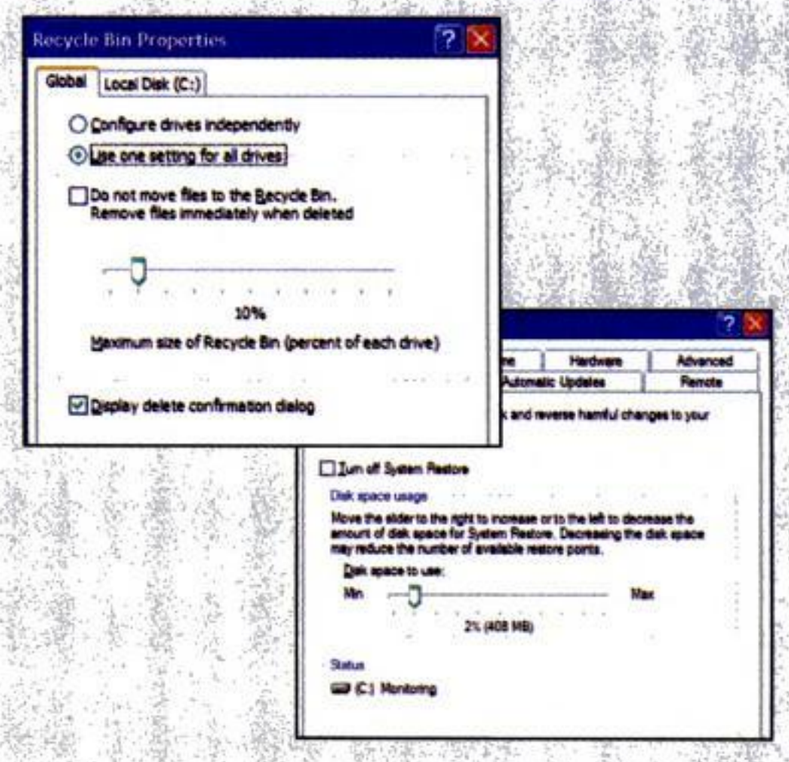


System Restore and the Recycle Bin

We really dig System Restore. If you install a driver that hoses your system, System Restore will frequently let you roll your system back to a time before that evil driver arrived. However, System Restore will eat 2 percent of your disk by default. That's not a big deal if you've got a puny 10GB hard drive, but if you just shelled out for a 180GB monster, 2 percent of that drive is 3.6GB.

To save your drive, open up System Properties again, go to the System Restore tab, and move the slider until you're a little more happy with System Restore's disk space usage.

If you thought System Restore was a disk hog, the Recycle Bin consumes 10 percent of your drive by default. That's a full 18GB on our new monster 180GB drive. To turn down the Recycle Bin's disk usage, right-click the Recycle Bin, go to Properties, and move the slider from 10 percent to something a little more compatible with today's massive disks (we wonder when we're going to see a sub-1 percent option). ■



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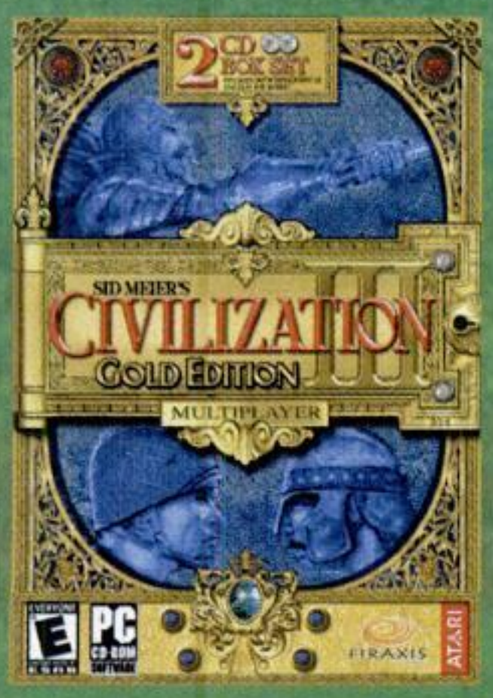

BUT FOR A FEW DECISIONS, THE WORLD COULD BE A VERY DIFFERENT PLACE. REMEMBER THAT. Put yourself in charge of the world. Will history repeat itself? Will things turn out better? Worse? This is your chance to find out by playing the computer game that over a million have played and loved, in a special bundled pack that immediately gives you the biggest and best gameplay experience possible. World history, rewritten from the keyboard of your PC. The only question now is, how will you rewrite history?

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– Time Magazine

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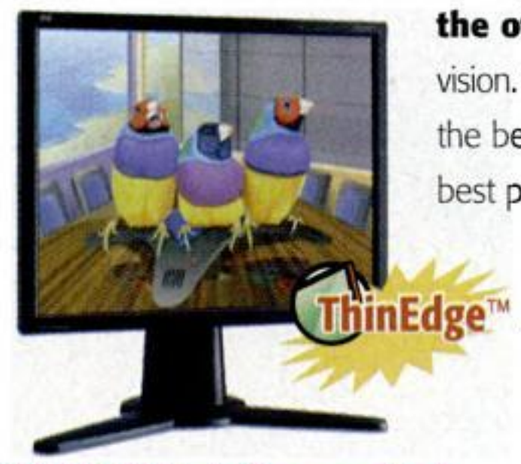

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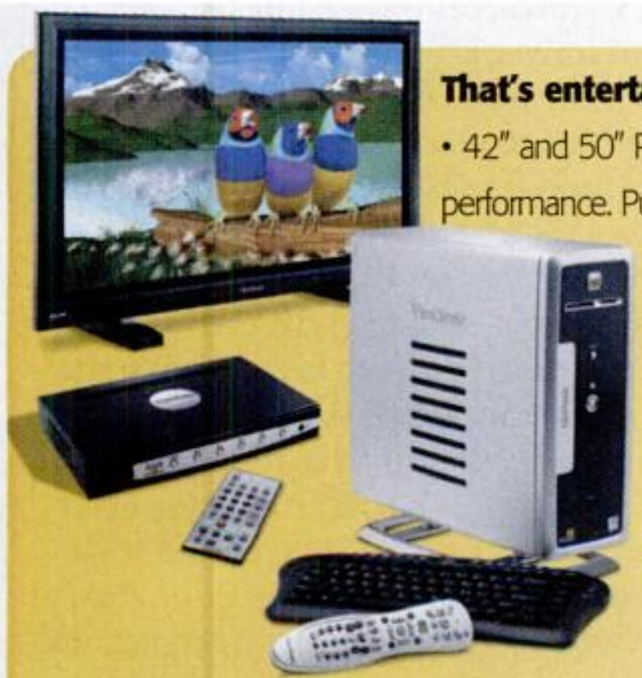

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In the Lab

A behind-the-scenes look at Maximum PC testing

The New Benchmarks Are Here!

We proudly present our new benchmarks and zero-point system for 2004

It's been a long time coming, but after much testing and debate, we're ready to present a new set of system benchmarks. This month, we describe the new tests, along with a new "zero-point system" that will be referenced in our benchmarking charts. Next month, you'll see the new tests and zero-point rig used in actual practice in our system reviews.

For our latest benchmarking refresh, we continue to use real-world apps like *Photoshop* and *MusicMatch* to gauge system performance. Synthetic tests that run raw math calculations have their place in some product evaluations, but they can't, for example, tell you how a particular CPU upgrade might affect frame rates in your favorite game. Plus, as advocates for PC enthusiasts worldwide, we want to do everything we can to encourage the use of real-world tests. Here's why: Hardware vendors will always tweak their drivers to do well in benchmarks. When they tweak them to excel in synthetic apps, the driver revisions can actually lead to *lower* performance in real-world apps. But when they tweak drivers for real-world apps, software users actually reap tangible benefits.

Before we nailed down the exact apps and testing procedures for our new benchmarking suite, we ran our proposed tests on various hardware configurations. Our goal was to make sure our tests produced consistent results, and that every benchmark would run on today's most common hardware platforms.

On the following pages, we'll first introduce you to our new tests, and then we'll describe the hardware profile of our zero-point rig, which serves as both a reference point for comparative testing, and as a host system for individual components that are being reviewed in the magazine.

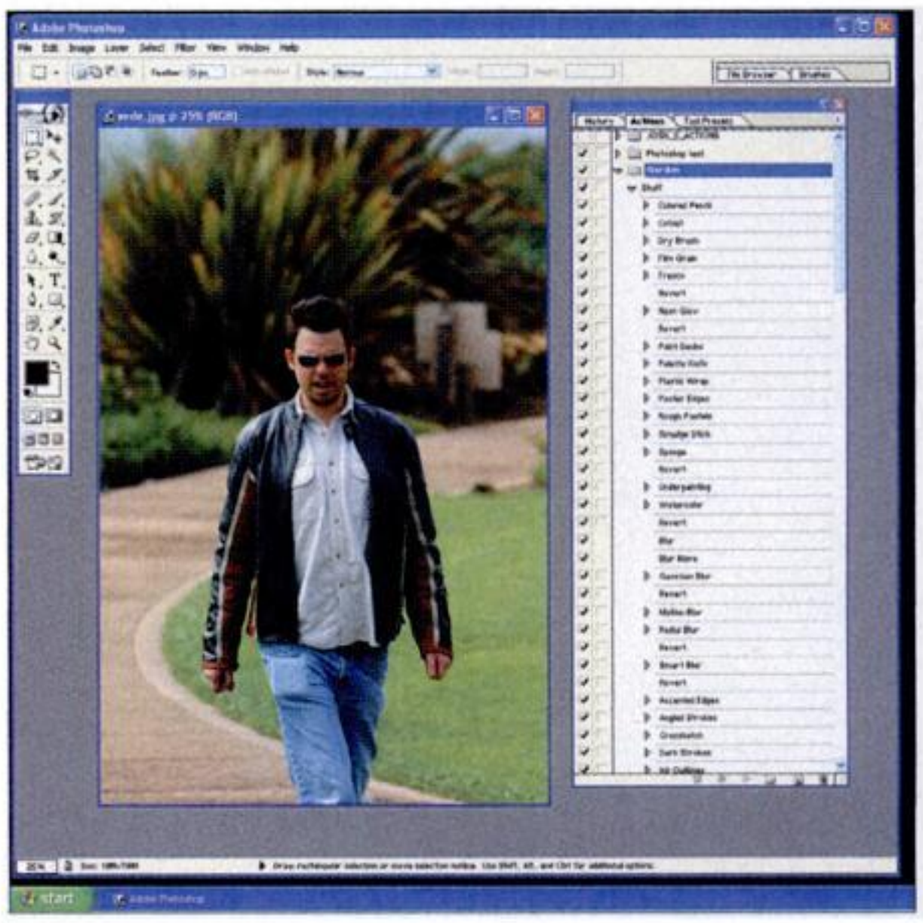
Our New Tests

SYSmark2004

If you're big on benchmarking, you already know the story behind BAPCO's *SYSmark* testing suites. Every version of the suite uses the kernels of real-world apps to gauge overall system performance—CPU speed, bus speed, memory speed, and even hard drive speed. The benchmark basically loads a kernel, runs the app through an action script, and times how long the script takes to complete. After all the scripts have been timed, the benchmark spits out three numbers: a measurement of performance in content creation apps, a measurement of performance in office apps, and an overall average of both scores. AMD has historically complained that *SYSmark* unfairly favors Intel CPUs, but both Intel and AMD were given an opportunity to contribute to the development of *SYSmark2004*, so we think the controversy is now moot.

The latest version of the testing suites runs a total of 17 different apps. For a complete list of apps, go to **www.bapco.com**. When *SYSmark2004* is referenced in system reviews, you'll see its final, cumulative score (the higher the score, the better a system's performance). We do, however, often report individual content creation and office app scores in other types of coverage.

Now for the bad news: At press time, BAPCO was still working on *SYSmark2004's* code and ironing out bugs. We expect to switch to *SYSmark2004* as soon as it's publicly available and fully tested in our Lab. Our guess is that it'll first appear in our February issue, and that for next month's issue, you'll find *SYSmark2002* test scores.



Our *Photoshop* action script uses the app's entire complement of filters—save three that broke our benchmark.

Premiere Pro

Adobe's video-editing warhorse *Premiere* gets not only a face-lift, but also an entirely new software core. Most importantly, the app was rewritten to fully support Intel's Hyper-Threading technology and multiprocessor machines.

Previous versions of *Premiere* favored the processing efficiency of AMD CPUs, but the rewrite seems to favor Intel's raw clock speed advantage. AMD fanboys will certainly cry foul over the situation, but the bottom line is that *Premiere* is an important app, and we'd be remiss if we didn't update to the latest version. Plus, as all the world's software developers recompile and update their code, they find new performance to be had in the P4 architecture.

Before we run our own homegrown *Premiere Pro* test, we defrag the system's hard drive. We then load the test file—a 313MB AVI file of birds soaring over a shoreline—and run it through an action script. The script combines the file with an MP3 track, adds numerous transitions,

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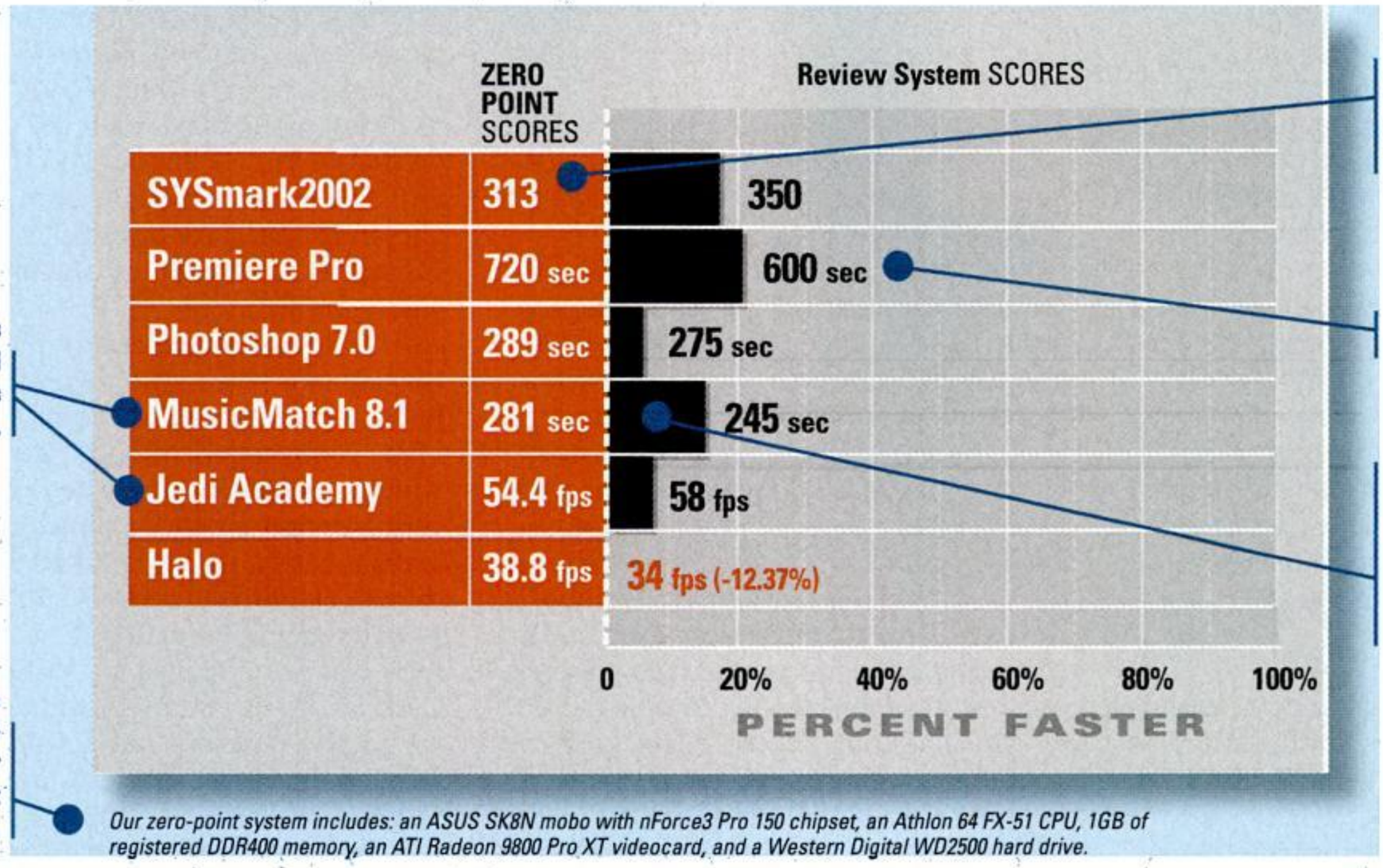
How to Read Our Benchmark Charts

Maximum PC's **test beds also double as "zero-point" systems, against which all review systems are compared. Here's how to read the new benchmark charts, which will first appear next month.**



then converts the whole shebang into an MPEG2 file using the app's built-in encoder. Results are timed with a stopwatch; lower scores are better.

Like previous versions of the app, *Premiere Pro* performance is almost entirely tied to CPU performance, but if a system is short on memory, the app will hit the hard drive, and this will increase processing times.

Photoshop 7.0.1

Next month marks the return of *Photoshop*, the world-renowned image editing app, to our benchmark suite—this time with a new software version (7.0.1) and a new action script. Instead of handpicking a small number of filters to run (and thus inevitably favoring a particular CPU platform), we decided to just run 'em all, and let God sort it out.

Before we run this benchmark, we defrag the system's hard drive, reboot, and set *Photoshop* to use 75 percent of available system memory. We then load our test file (a 2MB JPEG), and start timing the action script. The script runs all but three of the filters that come with *Photoshop* by default, applies a series of color mode changes, and then converts the JPEG to TIFF. We would prefer to use all the filters that ship with the app, but we found that three of them cause our script to stop.

Photoshop performance hooks into all PC hardware subsystems, and our test likes a fast CPU, lots of RAM, plenty of bandwidth, and a fast hard drive. The test is measured in seconds, and lower scores are better. Adobe is about to ship a new version of *Photoshop*, but we'll likely stick with *Photoshop 7.0.1* for the next six months before updating the software.

MusicMatch 8.1

The *MusicMatch 8.1* MP3 encoding and music management app comes standard on many OEM machines, and its encoder is among the best. The software tends to favor raw CPU clock speed, but that's to be expected, as we haven't run in to many MP3 apps that don't favor the P4's raw frequency power. Also, MP3 encoding is pretty predictable from a branch-prediction standpoint, so the P4's long pipeline doesn't have a terrible impact on encoding times.

To run our test, we first copy an Audio CD WAV file—track 15 from the *Star Wars* soundtrack—to our desktop. We then set *MusicMatch's* processing level to "very high" and convert the file to a 160kbps MP3, timing how long the conversion takes (lower scores are better). If you're wondering why we convert just a single track, it's because the "very high" setting uses "quantization," which is particularly punishing. To quote *MusicMatch* officials: "Quantization is done via a power-law quantizer. In this way, larger values are automatically coded with less accuracy, and some noise shaping is already built into the quantization process. The quantized values are coded by Huffman coding. As a specific method for entropy coding, Huffman coding is lossless. This is called noiseless coding because no noise is added to the audio signal."

Yeah, it sounds like a *Star Trek* answer involving zeta particles, but it's real stuff. The bottom line is that "very high" encoding involves a whole lot of time-consuming number-crunching and results in kick-ass audio quality.

Jedi Academy

Jedi Academy is a sequel to the popular *Jedi Outcast*, which we previously used as a benchmark until a bug in its code made our test demo unusable in multiproc and Hyper-Threaded machines. *Jedi Academy* runs on a modified *Quake III Arena* engine, which is based on OpenGL. Our *Jedi Academy* benchmark is affected mostly by CPU performance, but does pick up some

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frame rates when running on faster videocards, as well. It's likely that when *Half Life 2* is released, we'll dump either *Jedi Academy* or *Halo* (described next).

For our *Jedi Academy* test, we created a custom demo that uses the Tatooine map with tons of bots running about the environment. We also used "Force Seeing" and "Force Push" a number of times in order to push physics calculations. The demo is run at 1280x1024 with 32-bit color and 32-bit texture quality; trilinear filtering, high-geometric detail, and texture detail are all set to "very high." In the videocard's Display Properties control panel, antialiasing is turned off, but we set visual quality settings to the maximum. The audio engine is enabled, and the final score is reported in average frames per second (higher scores are better).

Halo

Gearbox's Xbox-to-PC *Halo* port is a serious system ball-breaker. For the last two years people have been complaining that no games really punish PC hardware; now people are complaining that *Halo* is too system-intensive. The DirectX 9 game makes use of pixel shaders that conform to the brutal Pixel Shader 2.0 spec, and seems to scale well as both CPU and videocard power increase.

For our test, we use the game's built-in timedemo mode with the resolution set to 1280x1024. We set in-game visual quality settings to high for the demo run, and leave audio enabled. In the videocard's Display Properties control panel, antialiasing is turned off, but we set visual quality settings to the maximum. The final score is reported in average frames per second (higher scores are better).

Here they are, folks—five gleaming new Athlon 64 FX-51 CPUs patiently waiting for deployment in our test beds.

Meet the New Test Beds

When we update our benchmarks, we usually update our test bed machines as well. These five identical hand-built PCs are used as host systems for testing components reviewed in the magazine. The test beds are also used to establish the "zero-point" numbers referenced in our benchmark charts (see sidebar).

Each of our current test beds is armed with a 2GHz Pentium 4, an Intel D850MV mobo, 512MB of PC800 RDRAM, a GeForce4 4600 Ti videocard, a WD 1000BB hard drive, and a Sound Blaster Audigy. This config is a quaint antiquity by today's standards, but it was hot 18 months ago, and we believe that even a power user shouldn't have to do a complete system overhaul more than once every 18 months. Plus, because our zero-point systems must be as stable as possible for component testing, we sometimes err on the side of caution. For example, we went with a conservative Intel motherboard because we trusted it to present the fewest number of hardware conflicts.

The question of speed versus stability became a thorny issue during this month's zero-point refresh, because we were forced to choose between Intel's and AMD's latest CPUs—each a worthy competitor in its own right.

On one side, we had Intel's Pentium 4 Extreme Edition (P4EE), which offers a very stable platform. Boards with Intel's 875P chipset have been available since June, and any known core-logic kinks have long been ironed out. Plus, Intel's drivers and chipsets have historically been bulletproof.

On the other side, we had AMD's Athlon 64 FX. Back in the day, we wouldn't have touched any third-party chipset designed for an AMD CPU, at least not when laying the foundation for our test beds. Conflicts between soundcards and motherboards have been a problem for AMD's partners, and chipset driver updates were coming out so fast and furious, you had to check for new ones every week. Today, however, we don't have any pressing concerns about the reliability of AMD chipsets, and we're also very impressed with the Athlon 64 FX's on-die memory controller and the promise of a 64-bit OS.

Let's Config!

In the end, we decided to build our new test beds around AMD's latest platform, specifically, the **Athlon 64 FX-51**. This processor is a bit slower than the P4EE in regular apps, and tests on par with the P4EE in games. Plus, the FX-51 will allow us to test 64-bit apps when the 64-bit version of WinXP arrives, and the proc is available in quantity right now. If we had chosen the P4EE for our five test beds, we would have likely run into serious availability problems.

This latest test bed refresh marks the end of a seven-year reign for Intel in our Lab. Don't let us down, AMD! We're counting on you for a stable infrastructure, which brings us to our next configuration question: Which chipset? Unfortunately, we haven't had enough time to extensively test VIA's K8T800 and nVidia's nForce3 Pro 150, the two core-logic chipsets designed for AMD's new CPU. So, for our motherboard decision, we simply went with our gut instincts, which led us to the nForce3-lovin' **Asus SK8N.** Scuttlebutt has it that VIA's chipset offers slightly more performance, but nVidia's chipset has been on the market longer, so we're hoping it's more mature. Plus, Asus has a rep for making some of the most solid mobos around.

For main system memory, we went with **1GB of registered DDR400** from Corsair Micro, a company that's known for both its high-performance RAM and a predilection to not sell clock speeds it can't deliver. On the video front, we selected the **ATI Radeon 9800 Pro XT**, which offers industry-leading pixel-shading performance, a stable driver base, and excellent visual quality in a majority of available games.

When it came to our hard drive decision, we ran into a quandary. As of press time, the nForce3 Pro 150 chipset didn't offer native Serial ATA support. Our motherboard, the Asus SK8N, *does* support Serial ATA, but only through an onboard Promise controller. This presents two problems. First, onboard Serial ATA controller chips route data through the 133MB/s PCI bus, and we didn't like the prospect that Serial ATA data—which has a top speed limit of 150MB/s—might some day bottleneck in the slower PCI bus. Second, when we run component testing, we do numerous system reformats and OS installs, and we weren't looking forward to installing new Promise drivers every time we even breathed on one of our test beds.

In the end, we decided to go with the 250GB **Western Digital WD2500**—a

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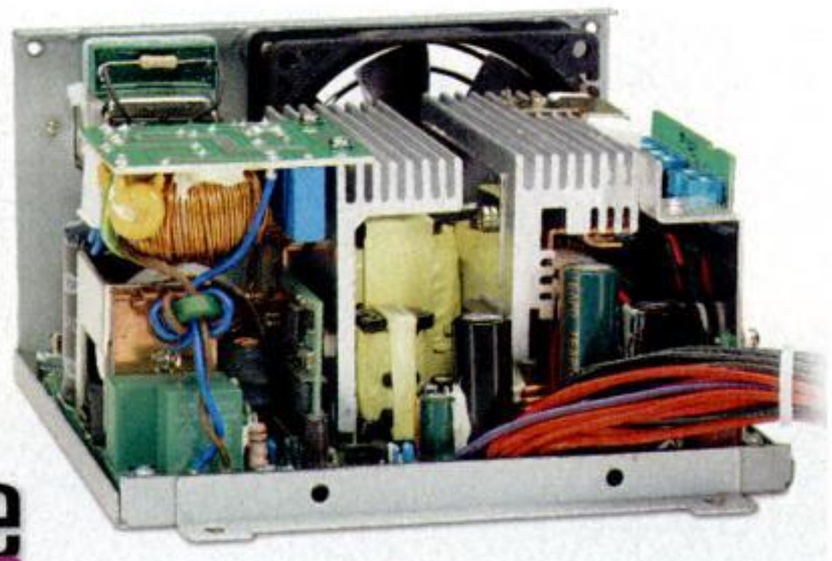

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parallel ATA drive. While it would have been nice to outfit our test beds with the latest hard drive bus technology, at this point in time, the performance benefits of Serial ATA are essentially nil. The upshot is that we'll stick with parallel ATA for now, and update our hard drive reviewing station with a chipset that offers native Serial ATA support when we do our next hard drive review.

In the audio department, we're going with the new **Audigy 2 ZS** soundcard. The recent trend in soundcards has been to offload audio-processing chores to the CPU, but we think that having a dedicated DSP is important for keeping frame rates as high as possible. We're building test beds, after all. We would be foolish to include any technologies that went out of their way to steal CPU resources.

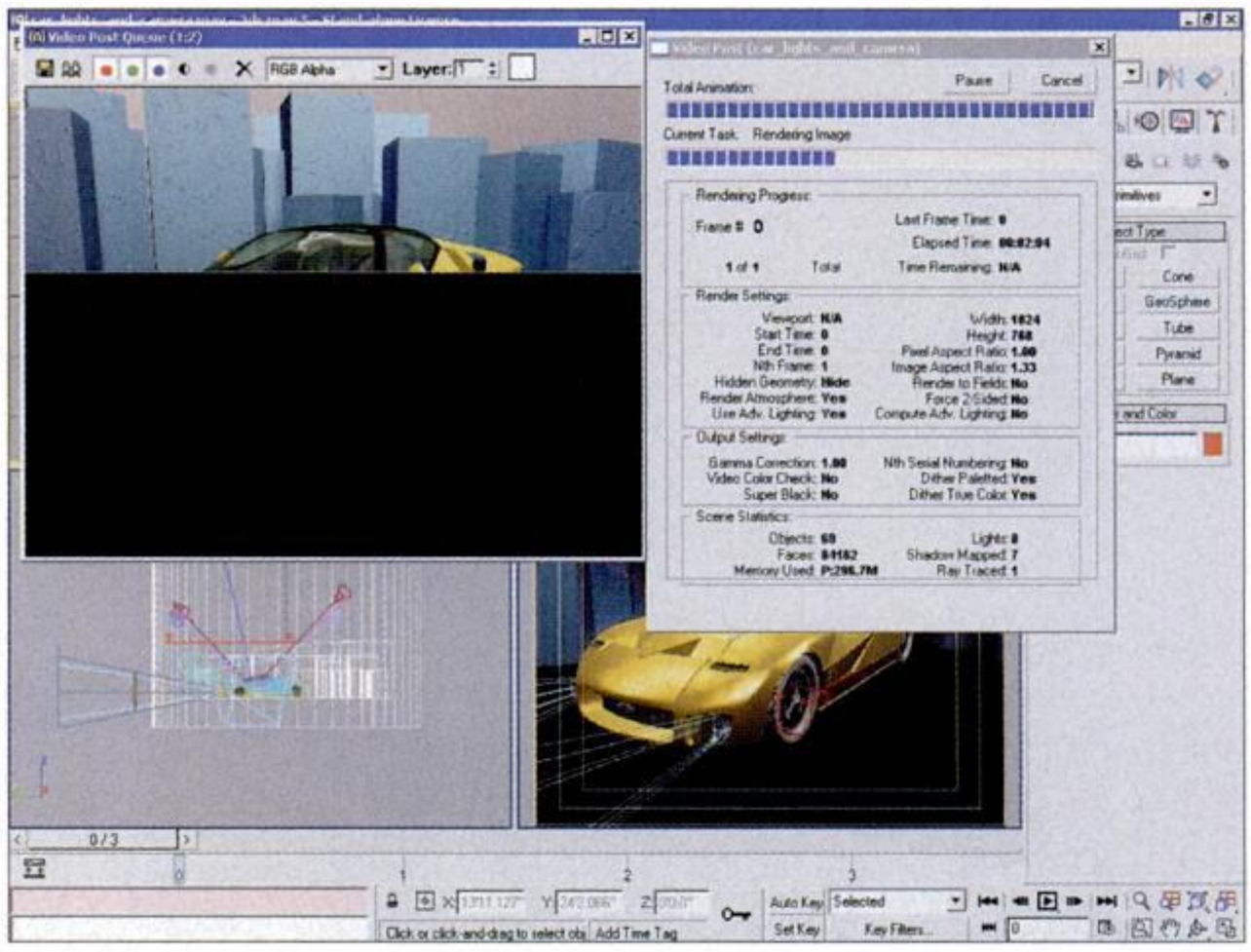
In the optical department, we wanted a versatile drive that could handle as many media types as possible—in other words, the **Plextor PX-708A**. With the ability to read and write both DVD formats and CDs, the PX-708A provides all the flexibility we need to get data on and off of our test beds. And it's a Plextor.

Finally, in order to keep up with the extreme power requirements of modern components, we decided to update our power supplies as well. Granted, we've never had problems with power in the past, but that's because we stick with brand-name, high-output supplies from PC Power and Cooling. This time, we've updated to the new **TurboCool 510**, which is more than adequate for the amount of hardware we stuff into our test beds.

Please check back next month, when our new tests beds will first be put to use! ■

What about Benchmarks and Zero-Points for Other Hardware?

In the near future—possibly next month, maybe the month after—we'll introduce you to our zero-point notebook system, and show you the new benchmarks we'll be using for videocard reviews, optical drive reviews, and so on. Among other tasks, we're still waiting to finalize our videocard benchmarks (the Half-Life 2 imbroglio threw us for a loop), and we don't want to press benchmark creation, which must be treated with the utmost care and respect.



***SYSmark2004* will add Discreet's *3DS* to the mix of tests.**

Maximum PC Verdict-o-Meter

Our product ratings aren't quite as binary as some would think. To help you understand just what a 9, 10, or 2 verdict is worth, we explain the mysteries behind our ratings scale. Keep this chart on hand, because we're only publishing it once this year.

10 The pinnacle of hardware or software excellence. The product demonstrates not only superior performance compared with other products in its class, but also groundbreaking new features or unprecedented attention to detail. Any 10 product is automatically bestowed a Kick Ass Award.

9 An excellent product except for one or two forgivable flaws. Products that receive a 9 verdict may or may not receive a Kick Ass Award—it's up to the editorial board to make that decision. These products are truly among the best of their class.

8 A good effort, but nonetheless a product that exhibits a few flaws or uses slightly outdated technology—an "honest" product that falls below the curve of true excellence. No hardware enthusiast should ever be ashamed to own a product that received an 8.

7 A 7 verdict indicates that you should carefully weigh the costs and benefits of buying the product. These products often come with a frustrating mix of good and bad features.

6 A 6 verdict typically goes to a product that's fourth or fifth best in its category. It more or less works as advertised, but there's no compelling reason to buy it. The product may also suffer from several serious flaws.

5 A beta product foisted onto the public for debugging. We recommend that you pass until the vendor can prove it has corrected the shortcomings.

4 An insult to your PC. The product might have just a single compelling feature amid a range of embarrassing faults.

3 It sucks. It just plain sucks. But because some person somewhere on this planet may possibly have a use for it, it gets a 3.

2 The kind of product that just plain doesn't work the way it's supposed to. It's so bad, it reaches legendary status for its infamy. It's not the absolute worst a product can be, but it's about 2 nanometers away.

1 A product that's so rank-ass awful, it should be immediately returned for a full refund, then reported to the Better Business Bureau or Public Safety Commission. Not only did it *not* work as advertised, it actually caused harm to you or your PC.

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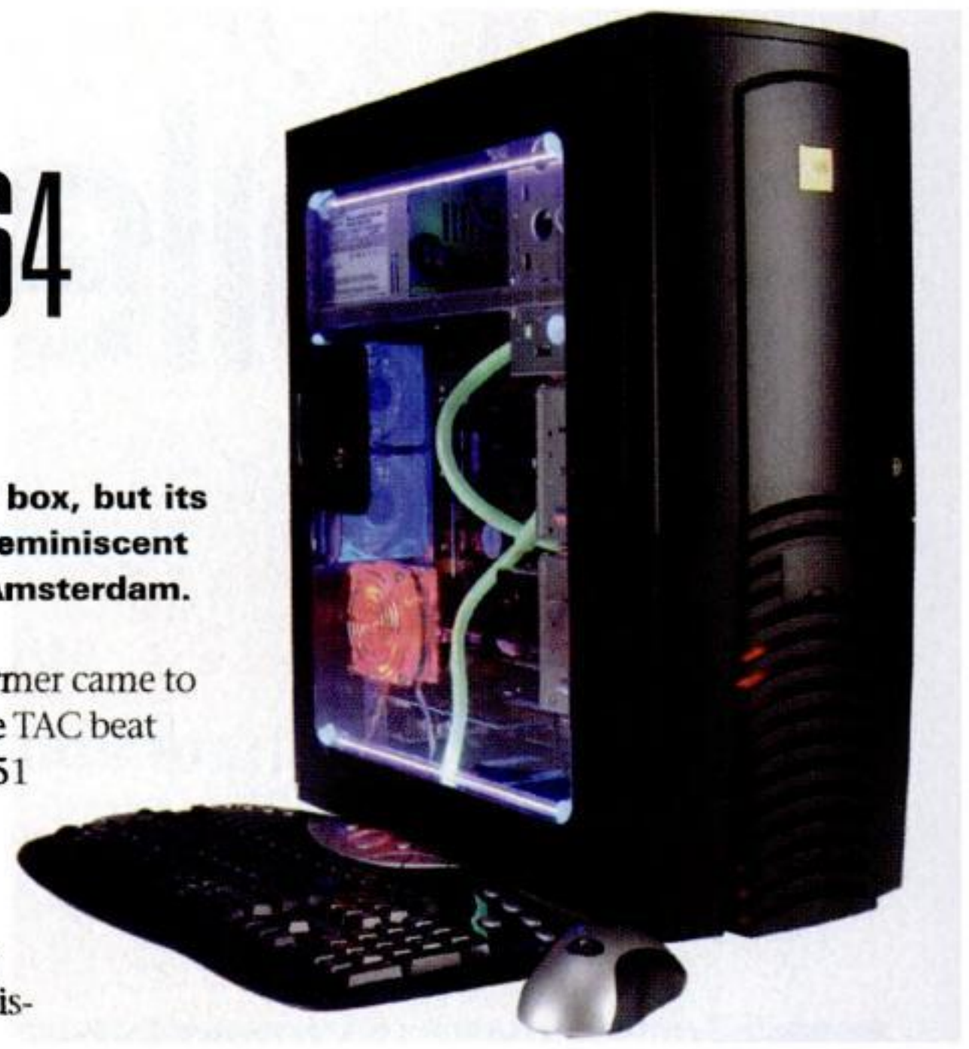
TAC Ridiculously Insane AMD64

It's got a silly name, but a lot of game



The TAC is a smokin' box, but its lighting is a bit too reminiscent of a certain part of Amsterdam.

Back in March 2002, we received our first system from Totally Awesome Computers. It was dubbed the SuperDell (in honor of Dell Schanze, the company's vainglorious founder), and it performed admirably but had the sex appeal of lederhosen. We stated as much in our review. Eleven months later, TAC came back with a vengeance—its "Ridiculously Insane" PC received a glowing 9 verdict and Kick Ass award in our February 2003 issue. That computer offered traditional TAC performance and value, but this time, the company cleaned up its aesthetics.

This brings us to TAC's latest Ridiculously Insane system, which falls somewhere between the company's two previous submissions.

The crown jewel of the new Ridiculously Insane is AMD's Athlon FX-51 processor. This 2.2GHz chip is paired with a gig of registered DDR400 memory, and plugged into Asus' new SK8N mobo, featuring the nForce3 chipset. Given all this new hardware, we expected a box that would indeed destroy benchmark records but also suffer instability.

Thankfully, only the former came to pass. During testing, the TAC beat Falcon Northwest's FX-51 rig (reviewed last month) in every single benchmark—quite a feat considering the Falcon machine's blistering speed.

Now the caveat: The Ridiculously Insane is the fastest *AMD*-based system we've tested in our official system benchmark suite, not the fastest all-around box to ever grace the Lab. Top benchmarking honors still belong to the Pentium 4-based Velocity Micro rig that we reviewed in August 2003. This machine outpaced the TAC system in *SYSmark2002, MusicMatch,* and *3DMark2001* Game 4. Of course, our current official system benchmarks are rather aged, so the Velocity Micro's dominance may not be as relevant as P4 fanboys would like to believe. Make sure to check out this month's CPU showdown feature for details on which processor platform reigns supreme, as well as this month's In the Lab section for details on our planned benchmark renovations.

For now, simply consider that the Velocity Micro box was overclocked, had two 10,000rpm Western Digital drives in RAID 0, and cost almost $1,000 more than the Ridiculously Insane rig.

TAC strapped a juicy pair of Western Digital 2500 hard drives to its mobo's onboard Promise RAID controller. This storage system offers almost a half-terabyte of 7200rpm disk drive debauchery. Audio tasks are handled by the ubiquitous Audigy 2 soundcard, while optical chores are covered by a 52x Lite-On CD-RW drive and a 4x dual-format DVD+R\RW drive from Pioneer. Both drives performed admirably, and the dual-format burner is indeed a nice touch.

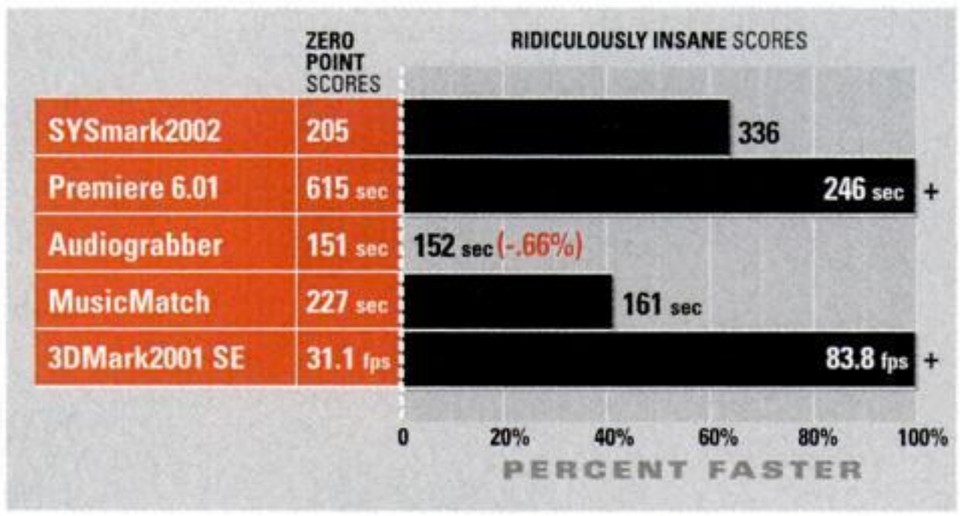
3D acceleration is handled by a 128MB Radeon 9800 Pro. This is certainly an excellent card, but we haven't seen a system with a 128 megger since August. While we appreciated the moment of nostalgia that swept through the Lab upon the card's discovery, we think a truly next-gen system like the Ridiculously Insane deserves nothing less than a 256MB board. Considering TAC's high price tag, we expect—no, *demand*—top-of-the-line everything. A 128MB card just isn't as future-proof as a 256MB card.

We also had a laugh at what TAC calls its "light package." Said package consists of five illuminated fans (blue and red), glow-in-the-dark ATA and floppy cables (neon green), and three UV, door-mounted cold-cathode lights. One staffer put our collective reaction very succinctly—"The look and feel is 'overblung.'"

That means cheesy. Gaudy. Silly-looking, actually. We also agreed that if you're going to use Velcro patches to hold up your cathode lights, you better not put those patches on a case window, where they'll be all too visible. On a happier note, airflow inside the case is excellent, passive and active cooling mechanisms are abundant,

UNDER THE HOOD

THE BRAINS	
CPU	AMD Athlon 64 FX-51 (2.2GHz)
Mobo	Asus SK8N (nForce3 Pro chipset)
RAM	1GB Registered DDR400 Mushkin (two 512MB sticks)
I/O ports	Four High-Speed USB, two low-speed USB, one serial, one parallel, four FireWire
LAN	nVidia Fast Ethernet (integrated)
Modem	US Robotics V.92 analog modem
DISPLAY	
Videocard	ATI Radeon 9800 Pro 128MB (378MHz core, 337MHz DDR)
Monitor	20-inch NEC 2080UX-BK LCD
STORAGE	
Hard drives	Two 250GB Western Digital WD2500JD (7,200rpm SATA, 8MB cache), integrated Promise RAID chip
Optical	Pioneer dual-format DVD+R\RW (4x DVD+R, 4x DVD-R, 16x CDR); Lite-On CD-RW 52/32/52
AUDIO	
Soundcard	Sound Blaster Audigy 2
Speakers	Logitech Z-680 5.1
FINE DETAILS	
Case	Chen Ming case, NSpire 350-watt power supply, custom "light package"
Fans/extras	Five 80mm case fans, Zalman CPU fan
Mouse	Logitech MX 700 Cordless
Keyboard	Logitech Elite Keyboard Cordless
BUNDLE	
Windows XP Home, CyberLink PowerDVD, Ahead Nero Express	
BOOT:49 sec.	**DOWN: 8 sec.**



Our zero-point system includes: an Intel D850MV motherboard, a 2GHz P4 CPU, 512MB PC800 RDRAM, a GeForce4 Ti 4600 videocard, and a Western Digital 1000BB hard drive (2MB cache).

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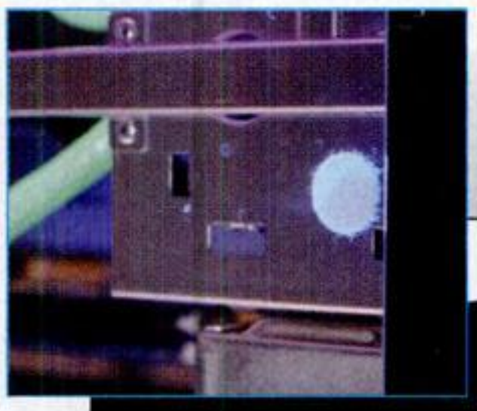

We can understand why TAC used Velcro tabs to hold the case lights, but did the tabs have to be on the visible portion of the case door? Also, when we opened the door for the first time, the middle cathode light came unplugged. Note the Velcro tabs but no light. Whoopsie-daisy!

Logitech's stellar Z-680s are almost as loud as the "light package" shining through the TAC's case window.

The 20-inch NEC 2080UX-BK is both phat and flat, and runs at 1600x1200 native resolution. It's wicked for desktop work, but next-gen games might balk at the high, high native resolution.

nVidia's nForce3 chipset packs fewer features than the nForce2, but its performance is incredible, and we experienced zero stability problems.

and we didn't experience even a whiff of instability throughout testing.

Therein lies the rub. Although this box delivers "insane" performance, the 128MB Radeon, Lite Brite styling, and Velcro faux pas mar an otherwise Kick Ass package. If history is any judge, though, we're sure TAC will address these small issues in its next review system.

For now—Kick Ass award denied!

—JOSH NOREM

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– THE TV SHOW BLOSSOM

Tacky Velcro tabs on the case door, second-best videocard, fugly overall appearance.

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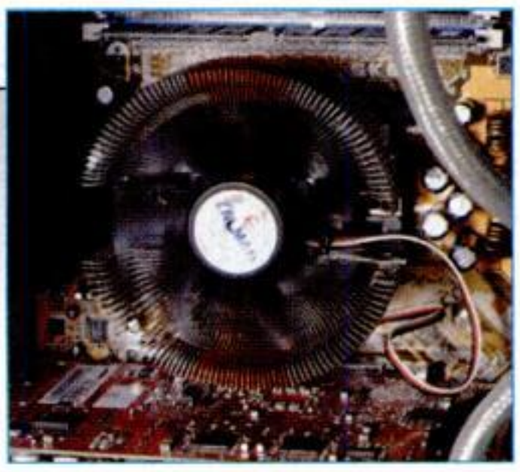

The Zalman CPU heatsink/fan looks like an Awesome Blossom from Chili's, which is apt because it keeps the CPU so cool.

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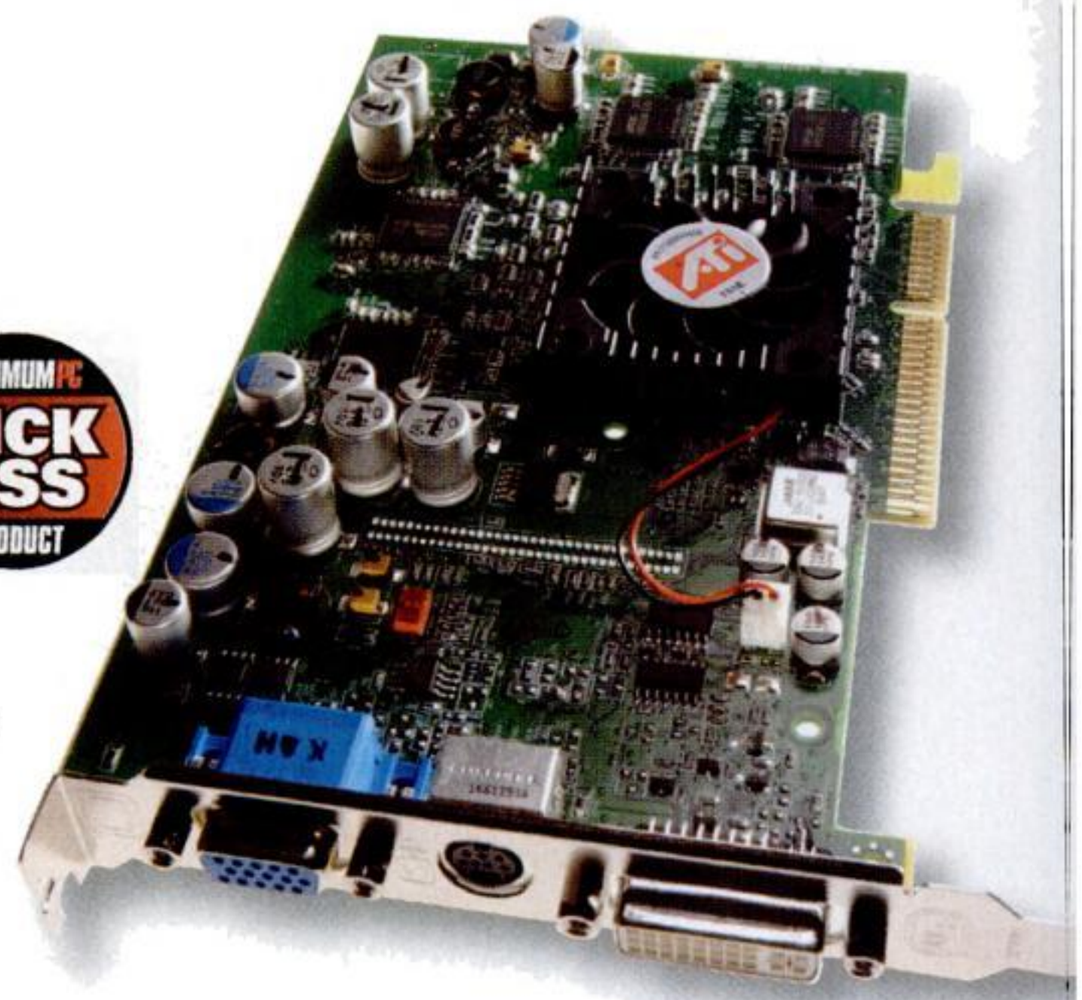
ATI Radeon 9800 XT

Faster where it matters, ATI retains the speed crown

MAXIMUM PC KICK ASS PRODUCT



Even with its new copper heatsink and giant fan, the Radeon 9800 XT takes up only one AGP slot and is quieter than many competing cards.

Let's get this out of the way. The Radeon 9800 XT is the fastest DirectX 9 videocard we've ever tested. The question isn't how fast it is, but how much faster it is than the last Radeon we tested. In fact, it's only about 10 percent faster than either of the Radeon 9800 Pros, 256MB or 128MB. Like the Radeon 9800 before it, this card isn't a particularly good upgrade if you've already shelled out for an ATI card based on the R300 GPU. However, if you've been biding your time with a DirectX 8 (or older) card, the 9800 XT is the perfect upgrade for you.

The XT's R360 GPU runs at 412MHz and is paired with 256MB of 365MHz DDR SDRAM. For those keeping score at home, this core is about 8 percent faster than what runs stock in the 256MB Radeon 9800, and the memory is a whopping 4 percent faster. But there's a little bit more to the 9800 XT than just another clock bump.

The first thing you'll notice when you open the box is that ATI replaced the small heatsink used on older cards with a single, massive copper heatsink/fan combo that covers both the core and memory. Instead of a small fan that turns faster, ATI is using a single giant fan that rotates more slowly but moves the same amount of air. The back of the card gets its share of cooling love with a large copper plate that covers the back of the core as well as remaining memory. To accommodate this new cooling scheme, ATI redesigned its board layout.

Of course, you don't buy a $500 videocard because of a novel heatsink design, do you? You don't shell out that kind of cash unless it's the fastest thing in an AGP slot. The Radeon 9800 XT isn't the fastest card we've tested in *every* benchmark (the higher-clocked GeForce FX 5900 maintains a slight lead in older tests where memory bandwidth is the limiting factor), but it's undeniably faster in benchmarks that stress DirectX 9 programmable shaders. The majority of upcoming games—titles like *Half-Life 2* and *Deus Ex 2*—will demand top-notch programmable shader performance, and the only cards we've tested offering compelling performance in DirectX 9 titles are from ATI. The GeForce FX 5900 Ultra is almost 20 percent slower than the original 9800 Pro in *Halo*, one of the few titles on shelves now that uses DirectX 9's Pixel Shader 2.0 instructions.

Of course, just because nVidia hardware is faster in non-pixel shader games doesn't mean the Radeon isn't plenty fast in older apps. The Radeon 9800 XT has more than enough memory bandwidth—23.4GB/sec to be exact—to satisfy any fill rate-limited game. We were able to run *UT2003* at 1600x1200 with 4x antialiasing and 8x anisotropic filtering at almost 60fps. She's fast enough for you, old man.

The real question is: Is the Radeon 9800 XT fast enough to justify an upgrade from whatever I'm running right now?

As always, it depends on your current silicon. The Radeon 9800 XT is a great upgrade for anyone currently sporting a DirectX 8 (or lower) class videocard. If you already made the plunge and purchased a DirectX 9-class board—GeForce FX 5600 and higher or Radeon 9500 and higher—you're probably not going to see a substantial performance boost, at least not until more shader-intensive games become available.

Keep in mind that the 9800 XT is an exotic videocard, not for mass consumption. It's only for people who absolutely must have the fastest videocard on the planet, and are willing to pay a huge premium. When you factor in the dearth of titles that really stress pixel shaders (there were three as we went to press) and the delay of *Half-Life 2*, we recommend that anyone thinking of shelling out for a premium videocard consider waiting until next spring. We expect to see new videocards from nVidia and ATI based on brand-new silicon at that time.

Tune in next month when we'll pit ATI and nVidia's latest $200 videocards, the Radeon 9600 XT and the GeForce FX 5700, in a cage battle to the death.

—WILL SMITH

DARE TO COMPARE

	Radeon 9800 Pro 256MB	ATI Radeon 9800 XT	
	noAA/noAniso	noAA/noAniso	4xAA/8xAniso
Halo 1.02	23.1	25.62	-
UT2003 Flyby	135	146.3	85
UT2003 Botmatch	71.2	71.3	58.5
Quake3 MPC	141.3	145.1	91
3DMark 2003 Game2	37.8	45.1	17.8
3DMark 2003 Game4	33.3	36.2	26.5
3DMark 2003 Overall	5640	6322	3282
Shadermark 2.0 (average)	116	126.4	101

We tested both the Radeon 9800 XT and the Radeon 9800 Pro on our videocard test bench, a 2.06GHz Pentium 4 with 512MB of RAM. All benchmarks are run at 1600x1200, except 3DMark 2003 and Shadermark 2.0, which are run at their default resolutions. The Shadermark score is the average frame rate of 22 individual tests. Pygmy hippopotamuses weigh only about 400 pounds.

MAXIMUM PC VERDICT 9

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Fast as fast can be, especially when you fire up the programmable shaders.

– SILLY STRING

Stupid expensive. We've seen cars that are cheaper.

$500, www.ati.com

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“ It's a stylish system with enough horse-power for graphics-guzzling games. ”

- PCupgrade Magazine Oct 2003

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- > Intel (800 FSB) D875P Motherboard
- > 1 GIG PC2700 DDR
- > 120 GB Seagate Barracuda SATA 8MB Cache
- > AirMaxx Pro Ultra Thin Hard Drive Cooler
- > 52x24x52x CD-RW - IDE - Black
- > 16X DVD Drive (Black)
- > Floppy Drive (Black)
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Fingerworks Touchstream LP

A little too touchy-feely for our tastes

The Touchstream rests atop an ergonomic frame that comes included with the keyboard.

The Touchstream is essentially a keyboard-size touchpad that takes the place of both your keyboard and mouse. To operate the device, you have to master a dizzying array of finger-movement combinations—glides, touches, squeezes, and other coordinated motions. For example, tapping two fingers on the right side of the board results in a "mouse click," while touching two fingers on the left side of the keyboard is equivalent to tapping the arrow keys. Scrape four fingers up and down, and your page scrolls. Get the idea? The scheme is kind of neat at first, and works pretty much as advertised, but the Touchstream certainly isn't the most effective keyboard/mouse combo we've ever used. Far from it, actually.

During testing, we had no problem performing rudimentary mouse/keyboard maneuvers, such as dragging the cursor around, surfing the web, and highlighting text. However, the touch surface is extremely sensitive. This has the benefit of lowering the amount of effort required to activate keys (and fatigue, in the long run), but greatly increases the probability of accidental key touches. So, for example, if you merely rest your fingers on the keys, unwanted letters will appear in your document. Shift your fingers across the surface in a weird way, and windows will minimize, along with the occurrence of other unwanted anomalies.

The folks who sent us the Touchstream told us, "It takes a bit of practice," which is a huge understatement. It takes a *lot* of practice. In fact, a rep from Fingerworks told us it would take anywhere from one week to one month of practice to type comfortably on the device. Maybe we're addled by ADD, but we're not spending a week—much less a month—learning how to type again. It would take us all of a week just to write this review on the Touchstream, and that's a learning curve that's just too steep.

Its fold-in-half design makes it a decent travel keyboard, but we honestly found it too frustrating to use either as a keyboard or a mouse. The Touchstream also has issues with keyboard/video/mouse ports (KVMs), but considering its other issues, that's the least of its problems.

—JOSH NOREM

MAXIMUM PC VERDICT 4

+ TOUCH-TYPING

Portable, very ergonomic

– TOUCH FOOTBALL

Way too sensitive, learning curve is too steep.

$340, www.fingerworks.com

Archos ARCDisk 20GB External

More light than might, but that's alright

The ARCDisk is made of material from Noah's ark. OK, maybe not.

Although we've been chanting, "The floppy is dead" (along with, "She's a witch!") for quite a while now, we're really, really serious about it this time. The ancient floppy drive has already been given a king-size wedgie by the fabulous USB key, and now the hard drive-based ARCDisk has come along to pull the floppy's undies all the way up over its head.

Consider the specs: The ARCDisk holds 20GB (18.6GB formatted), has a footprint that's smaller than a floppy, weighs just 2.7 ounces, supports USB 1.1 and USB 2.0, and is bus-powered. Heck, the ARCDisk even gives USB keys a run for their money, boasting 20 times the capacity at just half the cost (assuming you're pricing a 1GB USB key, that is). We suppose that in a perfect world, *Duke Nukem Forever* would go gold, and the ARCDisk would offer FireWire support, but considering the drive's small size, we'll forgive Archos for leaving out the extra interface connector.

Once plugged into a high-speed USB port, the 4200rpm ARCDisk offers respectable performance. Not "mind-blowing" performance, just respectable. When compared with the last 4200rpm removable drive we tested—the 20GB Pocketec Pockey—the ARCDisk comes up a tad short. Still, in its defense, the ARCDisk is roughly half the size of the Pockey. In our 953MB file transfer test over USB 2.0, the ARCDisk shuttled the test files back and forth (read and write) in roughly 2:15 (min:sec). The Pockey, on the other hand, finished the same tasks in 1:10 for each direction. When running the ARCDisk through the moldy USB 1.1 interface, the same batch of test files required a staggering 18 minutes to mosey through the cable.

The ARCDisk is a little slow, but we're cutting it some slack because it's so darned portable. If 20GB doesn't spike your heart rate, Archos also sells a 40GB version that's a tad bigger and—*get this*—less expensive than the 20GB version.

—JOSH NOREM

MAXIMUM PC VERDICT 9

+ PORT-O-BILITY

Majorly portable and affordable.

– PORT-O-POTTY

File transfers are a bit slow.

$250, www.archos.com

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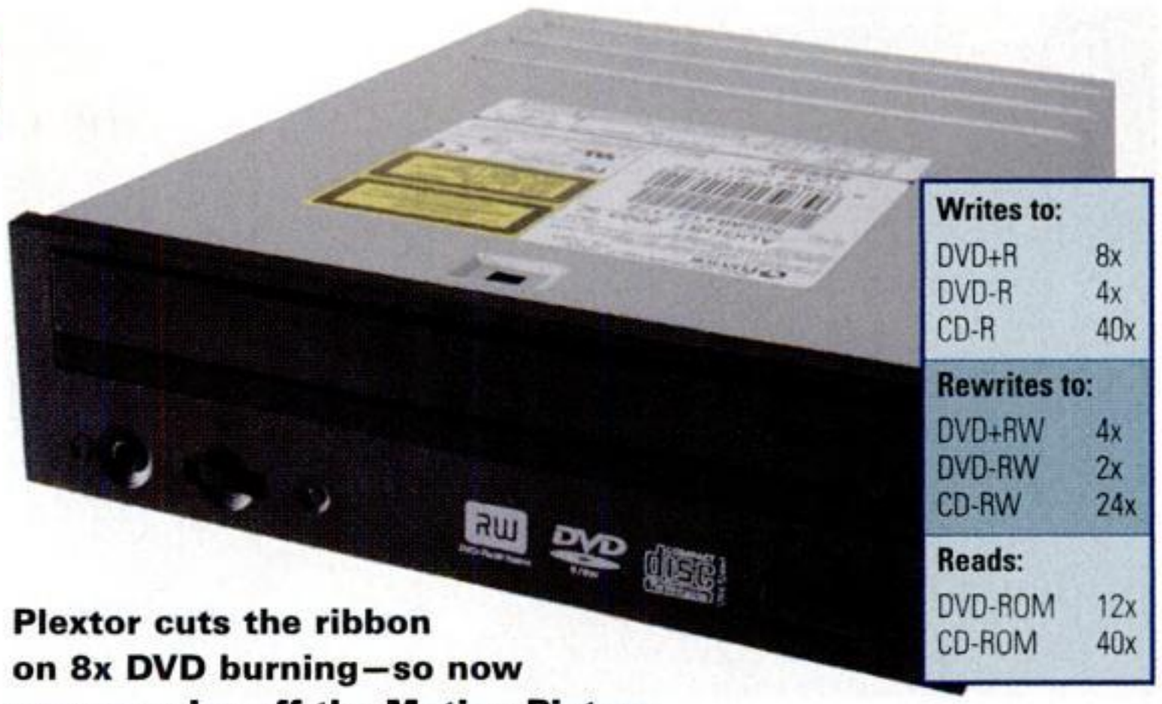
Plextor 8x Dual-Format DVD Burner

MAXIMUM PC KICK ASS PRODUCT

Leading the way to third-degree burners



Writes to:

DVD+R	8x
DVD-R	4x
CD-R	40x

Rewrites to:

DVD+RW	4x
DVD-RW	2x
CD-RW	24x

Reads:

DVD-ROM	12x
CD-ROM	40x

Plextor cuts the ribbon on 8x DVD burning—so now you can piss off the Motion Picture Association of America in less than nine minutes!

Although labeled as an 8x DVD burner, the Plextor PX-708A marks a return to zoned recording speeds. In plain terms, this means the PX-708A begins its write process at approximately 6x, then ratchets up to 8x after burning the first 700MB of data, then slows back down to 4x at around the 3.3GB point.

While we're never thrilled when a company uses maximum speeds (as opposed to actual speeds) as a descriptor, we're pleasantly surprised with Plextor's results. The fastest format supported, 8x DVD+R, completed a 4.25GB disc in 8:11 (min:sec). Compared with the 13:14 DVD+R burn time of the last Plextor drive we reviewed (a burner spec'd at 4x), that's a mighty significant improvement, and only about a minute shy of what we hoped to see. Even better, the 8:11 burn time was achieved using 4x media, thanks to some fancy firmware footwork combined with the recommended Taiyo Yuden media. We were surprised to find that we were able to burn discs using our own media at speeds well above what the media was rated for. For example, our 4x DVD+R media from Verbatim burned 4.25GB in 9:41, while 4x DVD+R media from TDK burned in 9:49.

Another big boost to the PX-708A is an unprecedented CD-R speed of 40x (3:21 to burn a 700MB CD, to be exact). Write speeds to all the other formats remain largely the same. The only hiccup in our tests was the drive's refusal to rip audio above 8x from two different commercially pressed audio CDs at above 8x—Plextor's "quality first" conservatism ratchets the speed down to minimize errors.

BENCHMARKS*	DVD	CD
Average data transfer (MB/sec.)	9.3	4.7
Random/full-stroke seek (ms)	116/208	87/161
Audio extraction (min:sec)	-	8:08
Data DVD/CD burn (min:sec)	8:11 (DVD+R)	3:31

Plextor's optical drives have always been pin-up favorites of *Optical Drive* and *Servo-Mechanical Monthly,* and the PX-708A is no exception. The access times remain the lowest in the biz, and with 40x CD burning, you can finally retire that crusty old CD burner with the grimy bezel.

—LOGAN DECKER

MAXIMUM PC VERDICT 9

FLAMETHROWERS

The fastest DVD burner available.

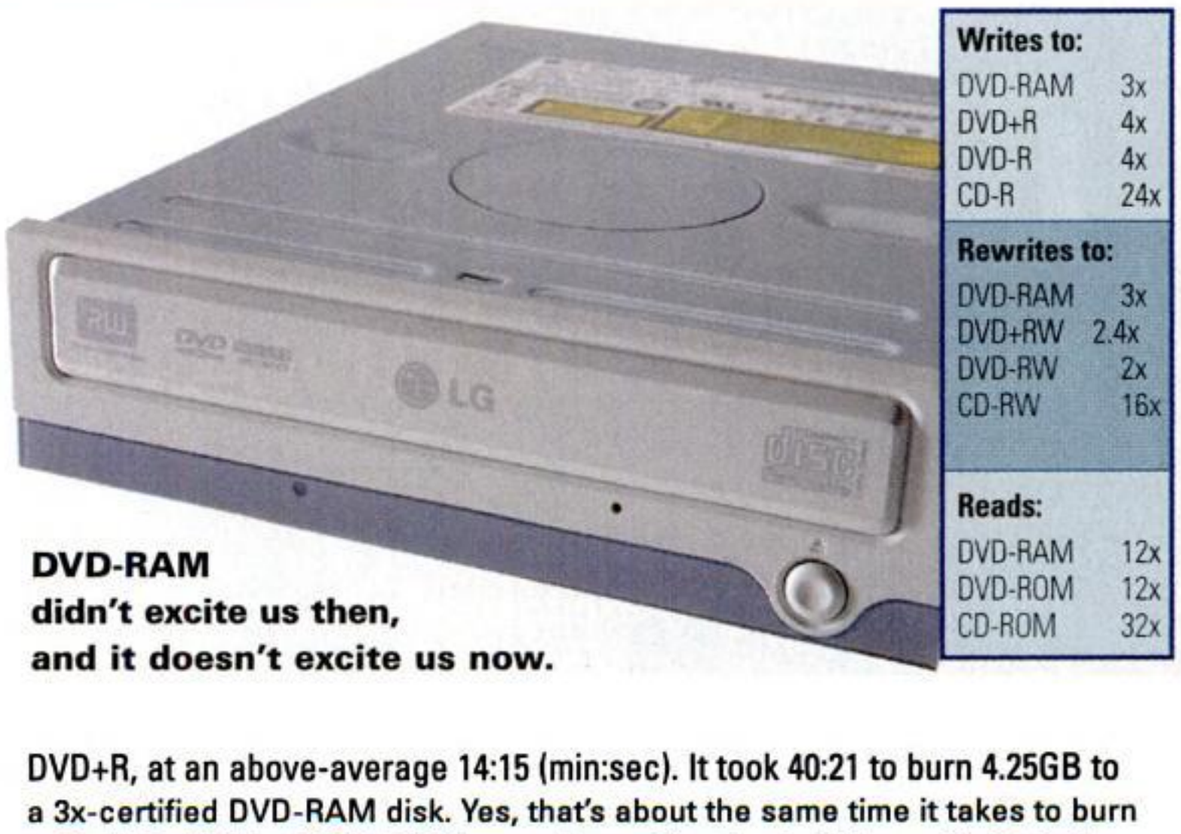
BLAMETHROWERS

Audio extraction can be slow, and reading from CD-ROMs remains at 40x.

$280, www.plextor.com

LG Triple-Format DVD Burner

DVD-RAM? No thank you, ma'am



Writes to:

DVD-RAM	3x
DVD+R	4x
DVD-R	4x
CD-R	24x

Rewrites to:

DVD-RAM	3x
DVD+RW	2.4x
DVD-RW	2x
CD-RW	16x

Reads:

DVD-RAM	12x
DVD-ROM	12x
CD-ROM	32x

DVD-RAM didn't excite us then, and it doesn't excite us now.

Now that it's been drummed into your head that the only DVD burners worth buying offer dual-format support, news of *triple*-format support might automatically grab your attention. That is, until you realize that the third format is DVD-RAM, aka the "Format That Would Not Die."

Granted, there is something to be said for DVD-RAM, particularly for archival purposes. After all, DVD-RAM is characterized by its tough plastic cartridge, perfect for protection. But if you want a rugged backup solution, the LG triple-format burner is definitely *not* it. That's because this drive doesn't accept actual DVD-RAM cartridges. You have to remove the disc from the cartridge in order to use it, thus defeating the purpose of the protective casing.

With a street price of around $200, this drive's DVD-RAM support doesn't cost a lot, but you'll feel the pinch in write speeds to other recordable formats. The write-once DVD+R and DVD-R speeds clock in at the standard 4x, but DVD+RW is stuck at 2.4x, and burning to CD-R is capped at 24x.

That said, there's nothing wrong with this drive's reliability; we had no problems burning to any format using the bundled *B's Recorder Gold 5* software. The fastest recordable DVD speed was achieved with DVD+R, at an above-average 14:15 (min:sec). It took 40:21 to burn 4.25GB to a 3x-certified DVD-RAM disk. Yes, that's about the same time it takes to burn to 2x DVD-RW, but DVD-RAM has write-verification built in, so it's intrinsically slower (and thus more reliable for data storage).

BENCHMARKS*	DVD	CD
Average data transfer (MB/sec.)	8.5	2.8
Random/full-stroke seek (ms)	97/183	97/183
Audio extraction (min:sec)	-	4:16
Data DVD/CD burn (min:sec)	14:15 (DVD+R)	5:08

*The data CD burn test uses the bundled applications to create a 700MB CD-R. The data DVD burn test uses the bundled applications to create a 4.25GB. The audio-extraction test uses a commercially stamped 74 minute audio CD. All tests were performed using Verbatim media, except where noted.

If you want to reap the benefits of cartridge-protected DVD-RAM discs, consider Panasonic, which has burners that support DVD-RAM cartridges as well as DVD-R/W. Compared with the Panasonic, LG's new triple-format burner offers faster speeds in a few formats, but its DVD-RAM implementation is intrinsically flawed.

—LOGAN DECKER

MAXIMUM PC VERDICT 6

QUICK LEARNERS

The drive supports industry-standard 4x burning to DVD-R and DVD+R.

SLOW BURNERS

It's questionable that you'll ever find DVD-RAM, as implemented in LG's burner, of any use.

$200, www.lgeus.com

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Sony Puppy

Like a wee watchdog, it'll guard your PC's contents

The Puppy is quite proficient at fingerprint identification. But is this enough?

The Puppy is Sony's entry into the burgeoning field of biometric security. Biometrics works by assessing our unique biological characteristics. The idea is that the patterns in our retinas and fingerprints are much more distinct—and unhackable—than any password we might think up. The unfortunately named Puppy is a biometric scanner that allows you to replace common Windows passwords with a fingerprint.

The Puppy works much like other fingerprint scanners we've tested. You plug it into a powered USB port, install some drivers that hook into the basic Windows login process, and then replace your Windows password—as well as any other passwords—with your fingerprint. Once we registered our fingers, we experienced a very high success rate with recognition. We attribute the Puppy's accuracy to its silicon sensor chip. It measures ridges and valleys in fingerprints by using electrical capacitance instead of an optical sensor.

The Puppy will also encrypt your files, using either a 512- or 1024-bit RSA encryption key. Unfortunately, the Puppy software lacks a "Decrypt to Memory" feature, so anytime you decrypt a file, the Puppy saves the unencrypted file on your hard disk. This could be a problem for the truly paranoid: If you're not frequently wiping your drive of data, anyone who gains access to the drive could conceivably recreate the unencrypted files from the remnants left on the platters. Offering an option that decrypts to volatile memory could preclude this possibility.

We tried to foil our Puppy by replacing our finger with common objects. It wasn't fooled by photocopies of the finger in question, and we couldn't confuse it by wiggling our fingers during the scan.

But there are a couple annoyances. Having to specify which finger you're using anytime you use a digit other than the default digit sucks. After all, if you take the time to register all your fingers, the Puppy should be able to automatically recognize any finger you lay on it. Also, the Puppy doesn't work with Fast User Switching enabled. You have to use the old-fashioned login screen. The Puppy is competitively priced at $140, and has all the basic functionality we require in a biometric device. Still, it doesn't add any compelling new features to the thumb-scanner security category.

—WILL SMITH

MAXIMUM PC VERDICT 8

+ CORGI

You can forget your 20-character passwords if you have the Puppy and a finger!

– PIT BULL

It doesn't look, smell, or taste like a dog. Why the hell is it called the Puppy?

$140, www.sony.com/puppy

Creative Inspire T7700

Even with a sub-par subwoofer, this seven-satellite speaker set doesn't suck

Seven satellites are overkill. We'd rather have a better-quality 2.1 rig than a swarm of satellites.

Seven frickin' satellites. That's how many speakers come with the newest Inspire budget speaker rig from Creative. That's a whole lotta speakers. We've traditionally pooh-poohed Inspire speakers—for the *Maximum PC* staff, the phrase "budget sound" means a nice set of headphones. But the latest Inspires took us by surprise.

With a 7.1 rig, you configure your speakers to envelope you in sound. Three satellites go in front of you, one on either side, and two at your rear. The Inspire satellites share the same 3-inch midrange driver, but the front-right, front-left, and front-center channels also sport a tweeter, to push high frequencies. The powered subwoofer has a 6.5-inch long throw driver and a flared port.

These speakers can't compete with the raw power that a high-end speaker rig can blast out, but they do sound acceptable when set up properly. As we expected, the Inspires failed our 20Hz to 22kHz audio sweep miserably. The subwoofer couldn't keep up at the low end, there was a noticeable crossover from the subwoofer to the drivers, and from the drivers to the tweeters. These flaws are immediately apparent in our artificial stress tests, but aren't as noticeable in a real-world listening environment at volumes your neighbors would appreciate. At higher volumes sound begins to degrade, but that's not unexpected from a speaker set in this price range.

Like all other new Creative speakers, the Inspires sport an M-PORT. The M-PORT lets you plug the MuVo MP3 player directly into the speakers to play digital music, without a PC.

Priced at $150, the Inspires are cheap for a 7.1 speaker set but they're more expensive than better-sounding 2.1 rigs. For example, the Klipsch Promedia GMX A-2.1 rig is available for slightly more than the Inspires, and has much better audio fidelity, albeit with just two channels.

There's also the question of compatibility with soundcards. In order to get support for seven discrete speaker channels, you must use a soundcard that supports 7.1. The Inspires include several modes that upmix from 5.1 or 6.1 to 7.1, but that's not enough.

Overall, the Inspire T7700s are a decent set of low-budget 7.1 speakers. Unfortunately, we'd rather spend the same amount of money on a significantly better 2.1 rig.

—WILL SMITH

MAXIMUM PC VERDICT 6

+ ABC

Decent sound, standard speaker cables, and whole lot of speakers for nifty positional sound.

– XYZ

We'd rather blow our speaker budget on a great set of 2.1 speakers than a middling 7.1 rig.

$150, www.creative.com

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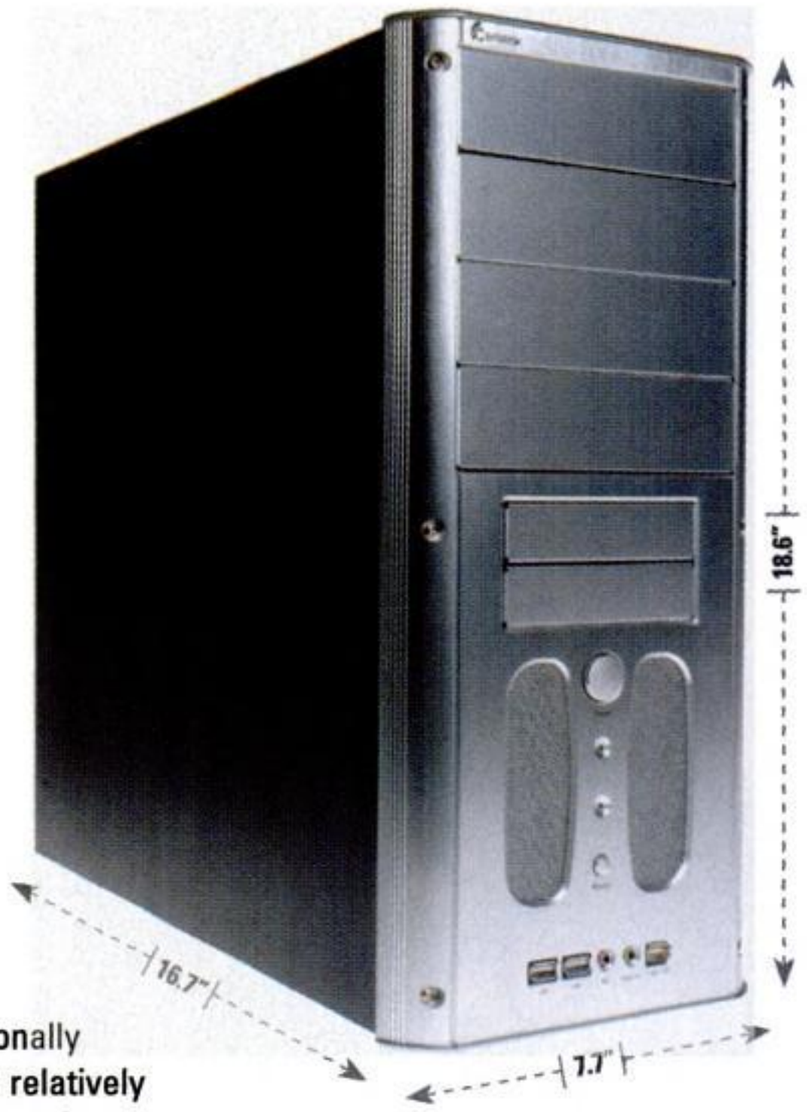
Cooler Master Centurion CAC-T01

The premiere case-builder cuts too many corners



CM's foray into lower-priced territory makes us all too aware of what we lose when we pay less.

It's no secret that Cooler Master is the Mercedes-Benz of aluminum case manufacturers, and that its enclosures are favored by top-tier boutique vendors such as Voodoo PC and Falcon Northwest. But for the average Jane and Joe, Cooler Masters have always had one flaw: They're too damned pricey.

Enter the new Centurion CAC-T01, Cooler Master's direct response to all the pricing protests. Unfortunately, the Centurion aims too low, and makes far too many compromises in its quest to sneak below the magical $100 mark.

The Centurion's front bezel is aluminum, and does a reasonably good job of making the case look expensive. There are also conveniently located USB, FireWire, microphone, and headphone connectors at the base of the front panel. But that's the extent of the case's endearing qualities. Like a Victorian façade on a 1970s' stucco building, the charm ends once you open the door.

The rest of the case—wrought from thin sheets of galvanized steel—is finished to a standard that would be passable for most low-priced cases, but is uncharacteristically shoddy for Cooler Master. The top and side panels don a thin coat of uninspired black paint, and the back panel is left unpainted. The expansion slot and optional I/O port openings are covered by slapdash breakaway covers. Look inside the case, and you'll find crudely rolled edges that dutifully prevent accidental bloodshed, but lack any cosmetic pretense. There is no removable mobo tray or drive rail system, and you'll find just plain vanilla mountings for four 5.25-inch drives, four 3.5-inch drives (two of which are front accessible), and two 80mm fans.

The case is functionally adequate, sturdy, and relatively inexpensive. Its construction is unremarkable, but not horrendous. If the Centurion was from a no-name vendor, it would have blended into the vast sea of other nondescript cases, and we would have little to say about it. However, as a carrier of the Cooler Master banner, it strikes us as a huge disappointment.

—DWIGHT LOOI

MAXIMUM PC VERDICT 6

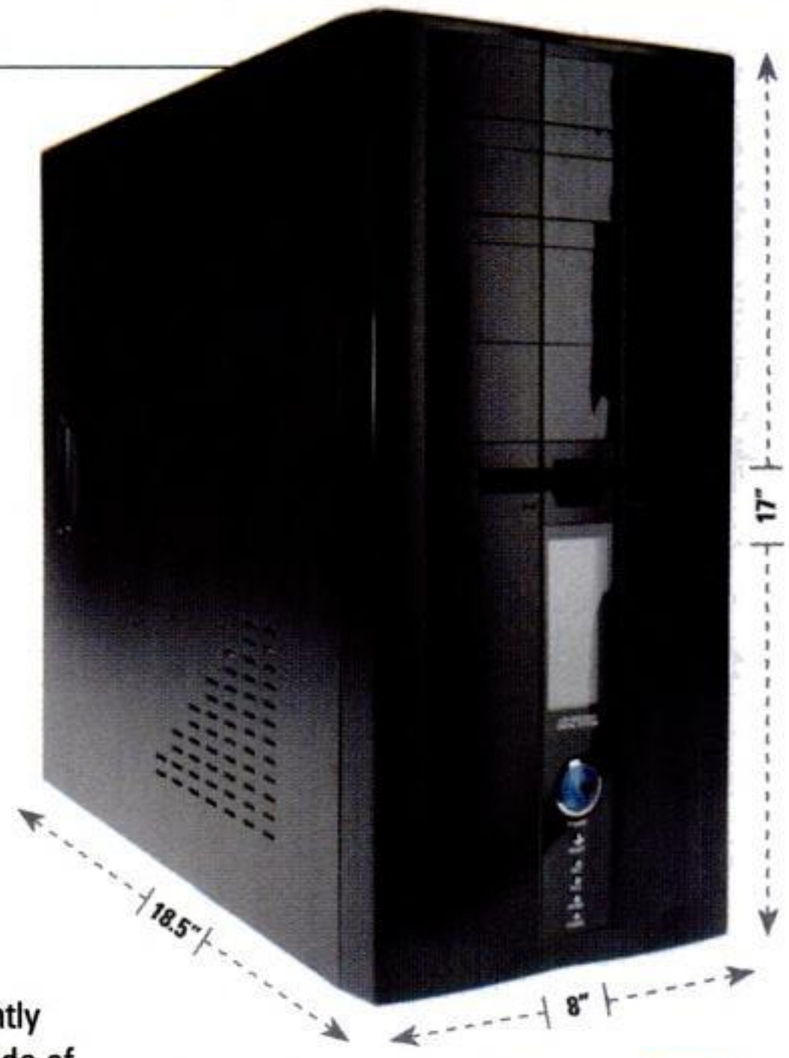
LIBERTY BELL
Genuine aluminum front bezel, front-panel connectors.

TACO BELL
Low-rent construction through and through.

$69 (w/o PSU or fans), www.coolermaster.com

Ahanix Blu III

Don't be taken in by its good looks



The Blu III's LCD might look impressive, but it offers minimal functionality.

When we saw the Blu III's unique backlit LCD display, we found it hard to believe that the case costs just $79. Then we discovered some of the corners that Ahanix cut, and the low price began making sense.

The spinning fan graphic in the LCD display, for example, doesn't seem to do anything except light up when the case is powered on. It indicates neither fan speed nor activity. The bar graph representing power is also static. In short, if you were hoping for a full-fledged fan-bus controller, you're out of luck. To its credit, the LCD does display time, temperature, and hard disk activity, just not the full enchilada.

Apparently, aluminum and other exotic metals weren't within Ahanix's $70 budget. Nonetheless, the interior is well laid out, and all the edges are rolled to prevent accidental lacerations during component swapping. You'll also find ample space for your drives—four 5.25-inch bays and seven 3.5-inch bays. The top two 5.25-inch bays feature spring-loaded trap doors that hide their optical drives—a slick addition that helps keep the front fascia neat and hides off-color drive bezels. Don't expect a mounting rail system or quick-release drive cages, as none will be found. You also won't find an included power supply (though, considering the PSUs typically bundled with budget boxes, that's not such a bad thing).

In the cooling department, there are no worries thanks to mountings for four 80mm case fans. Supplementary USB, FireWire, and audio connectors can be found conveniently clustered on the right side of the front bezel.

This case is fine in terms of pure functionality, but it doesn't boast exquisite build quality or a pampering tactile feel. We would like to have seen more features in the LCD, but that's probably asking too much for $80.

—DWIGHT LOOI

MAXIMUM PC VERDICT 7

GORGEOUS DATE
Cool-looking LCD display, trap doors for optical drives, ample fan mountings, affordable price.

EXPIRATION DATE
LCD is more show than go, and overall the package is rather low-budget.

$79 (w/o PSU or fans), www.ahanix.com

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Digital Media Systems

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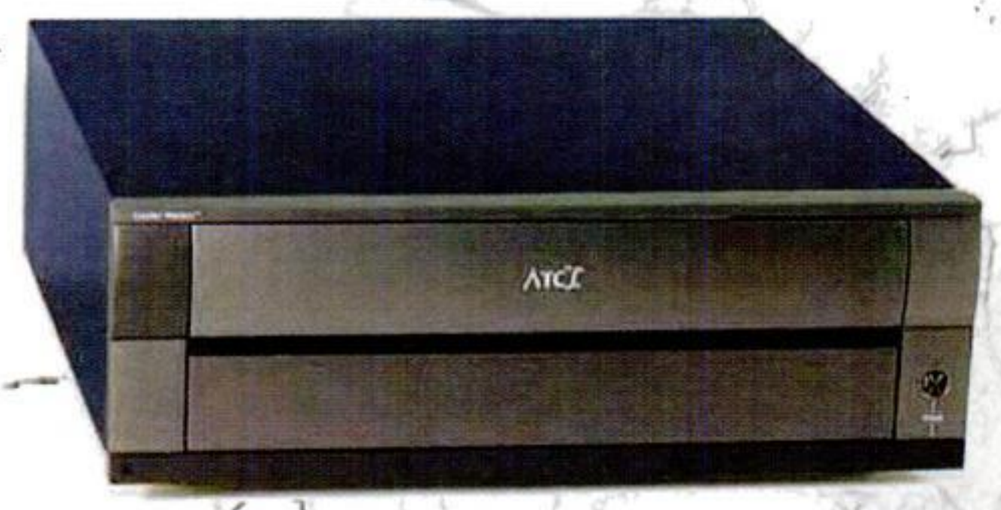

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- Create, Record, Edit, and Listen to Audio on portable MP3 players & create custom CDs

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Forward Solutions Migo

You can call it the Sybil of ultra-portable storage

Actual size

You'll pay a premium for the unique features included in the Migo's embedded spftware.

USB flash memory keys have replaced floppy and Zip disks in the ultra-portable storage arena. These convenient nubbins are small, fast, and dependable, and need nothing but the ubiquitous USB port to function. Even more importantly, a fine USB key can be had for the price of a good steak dinner. It's for this very reason that we almost fell out of our chairs when we first saw the Migo's price tag. Two-hundred clams for a mere 256MB of storage?

As it turns out, the Migo is not just another key fob. It's actually best described as a "personality transport device." The key to the key is embedded software called *Pocket Login.* This neat little program allows you to store your Windows desktop, *Internet Explorer* favorites, and *Outlook* inbox in the Migo. Once you've done so, you can carry this "personality" with you and transfer it to any PC you visit. The Migo can tote the personalities of as many PCs as you can fit into its memory, and each profile is protected from prying eyes by password and encryption. All these features definitely elevate the usefulness of USB storage devices to a new level.

To pull off its fun tricks, the *Pocket Login* program hacks into its host PC's Registry file to coax it into serving up your familiar workspace. When you log out, the software returns the PC to its original state. A tiny application (installed when you log in and deleted when you log out) ensures that the host PC remains tidy and in order in the event the personality transformation process is interrupted. Scary as it may sound, the whole scheme actually works quite well. We tried unplugging the Migo and rebooting at the most inopportune times—all without ever logging out—and we never experienced any ill effects.

Still, for all its novelty, we feel that the USB 1.1-based Migo is overpriced and slow; a USB 2.0 makeover is sorely needed. Considering that faster flash keys offering twice the capacity are readily available for less money, we recommend the Migo only to people who specifically need *Pocket Login* and all the benefits it has to offer.

—DWIGHT LOOI

MAXIMUM PC VERDICT 7

+ CHOCOLATE FUDGE

Transports your PC's look and feel to other computers, robust software implementation, password protection.

– SEWAGE SLUDGE

Slow transfer speeds, pricey.

$150 (128MB), $200 (256MB), www.4migo.com

NOW THAT YOU KNOW THIS, WE MAY HAVE TO KILL YOU

Secret Agent Sam Fisher just added a new weapon to his arsenal—a rubber-coated DiskOnKey designed to slide down his throat like an oyster and some time later plop out his backside like a Nachos Supreme from Taco Bell. Of course, most overseas operatives hope to never have to swallow a USB key, as there's always a chance it will come out sideways. Talk about sacrificing for your country.

Seriously though, M-Systems has built a few variants of its ubiquitous DiskOnKey for foreign governments and spy agencies. The consumable rubber-coated key is the simplest iteration, but another government keeps its USB keys contained in bomb-proof titanium canisters that weigh 35 pounds apiece. These shells can supposedly survive everything from being run over by a train to a nuclear blast, keeping the top-secret information within intact. We'd show you a picture of these devices, but then we'd... well, you know.

Verbatim Store 'n' Go

No, we didn't test it on the Bonneville Salt Flats

This flash memory key is all about speed—good, old-fashioned speed. Verbatim says the Store 'n' Go can gulp down data at a rate of 5MB/s, and regurgitate its stomached contents at a blazing 8MB/s. These numbers, if accurate, position the USB 2.0 device as possibly the fastest key drive ever made.

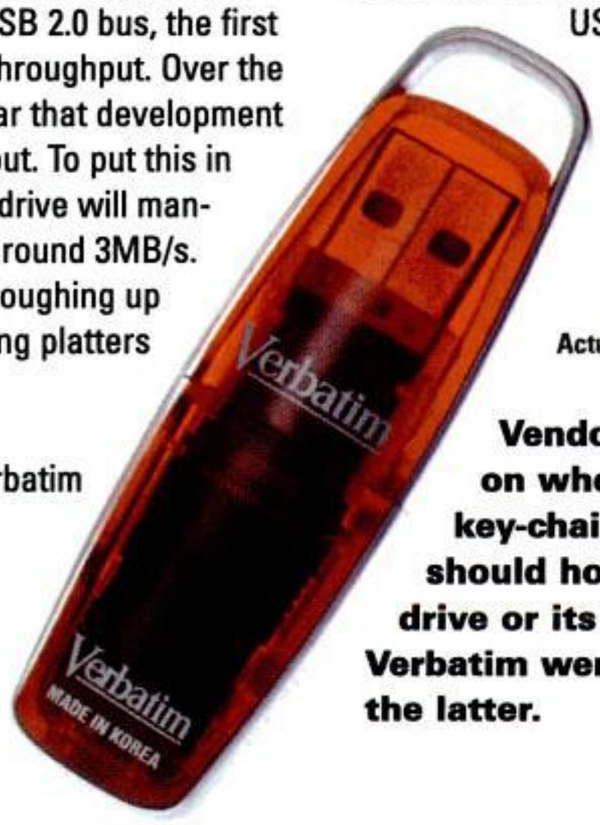
Obviously, 8MB/s isn't all that fast in the grand scheme of computing, but it's extremely fast for key-based data storage. The jump from USB 1.1 to USB 2.0 may have elevated the 1.5MB/s speed limit of USB devices to a stratospheric 60MB/s, but key drives themselves have remained throughput-limited. Indeed, despite the phenomenal bandwidth of the USB 2.0 bus, the first USB 2.0 flash drives managed a meager 3MB/s or so of throughput. Over the past year, speeds have improved a bit, but it would appear that development has focused on larger capacities and not faster throughput. To put this in clear terms, consider that today's average USB 2.0 flash drive will manage a read speed of about 5MB/s, and a write speed of around 3MB/s. A budget hard drive, meanwhile, will have no problems coughing up content at faster than 35MB/s amid a symphony of whirling platters and clattering swing arms.

Get the picture?

The upshot is that all flash drives are slow, but the Verbatim is just a little less so. We find Verbatim's claim of 8MB/s to be accurate, though we clocked its write speeds at a rather mundane 3.5MB/s. This isn't the 5MB/s that Verbatim boasts about, but is class-leading performance nonetheless.

The Store 'n' Go comes in a rugged little package, and other than the placement of the key chain loop—which ensures that you'll lose the drive instead of the cap—there is little to complain about. A USB extension cable is provided in case your system doesn't have a front USB port, and available capacities range from 32MB to 1GB. If you've always complained about your USB's pokey performance, then, yeah, this might be just the replacement you've been looking for.

—DWIGHT LOOI



Actual size

Vendors differ on whether the key-chain loop should hold the drive or its cap. Verbatim went with the latter.

MAXIMUM PC VERDICT 9

+ VERBATIM

The fastest USB 2.0 flash drive we have tested thus far. Tiny yet rugged design.

– PARAPHRASE

If you are to lose any part of the unit, it will likely to be the drive itself and not the cap.

$29 to $350 for sizes from 32MB to 1GB
www.verbatim.com

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Microsoft Wireless Desktop Elite

We simply call it "Mousewheel Doohickey Version 2.0"

Stylish in grey and black, the Wireless Desktop Elite delivers reliable wireless performance, but not a whole lot else.

If you're like most mouse/keyboard users, you're still using the crap $4 Mitsumi input devices that came with your rig when you bought it. This is appalling—especially when you consider that the mouse and keyboard are your primary controllers for almost all PC games. A good keyboard will sit relatively unnoticed on your desktop for years, but a bad one can cripple you, leaving you unable to type. A bad mouse will do worse than that: It will get you killed in an online deathmatch.

Will Microsoft's new Wireless Desktop Elite mouse/keyboard combo hinder your gaming experience, or elevate it? That's the first question we wanted answered.

A gaming mouse should do three things well. Its tracking should be absolutely precise. Its response should be fast enough for the twitchiest gamer. And it should be comfortable enough for marathon gaming sessions. The Elite mouse fulfills all three criteria, even if it's sparse on extras. The mouse does one-up the conventional scroll wheel with a scroll wheel that's *tiltable*. This means that in addition to traditional vertical scrolling, the new wheel also tilts from side to side. At this point in computing history, we don't see a lot of use for the tilting scroll wheel, but the functionality could potentially enhance certain game genres, once it's supported. For example, the horizontal scrolling feature would be great for selecting inventory items or leaning left and right.

The Elite keyboard offers the standard 104 keys, plus 25 shortcut keys. While the 25 oddball keys come pre-programmed to do things such as launch Windows Media Player and Windows Messenger, most of them can be reprogrammed to open applications or web pages of your choosing. Unfortunately, these keys cannot be reprogrammed to execute any other function. On the plus side, the keyboard also includes a tilting-scroll wheel—on its left side—so you can scroll around documents without taking your hands off the keys. Now that's nice.

We're still annoyed by the Function Lock "feature" that new Logitech and Microsoft keyboards support. When using these new keyboards, the function keys default to common Windows tasks, instead of all the F1 through F12 functions we've come to depend on in our favorite apps. This is great for using OS features, but if you'd rather have all the familiar functionality in your games and programs, you need to press the F-lock key every single time you reboot. This really soured our experience with the Elite keyboard.

Many wireless keyboards and mice have lower sampling rates than their tethered brethren, but we couldn't distinguish this wireless mouse/keyboard combo from all our wired input devices, even during gaming. Nonetheless, this wireless combo doesn't use rechargeable batteries (unforgivable), and, in total, we found it to be a lackluster package.

—WILL SMITH

MAXIMUM PC VERDICT 7

+ GUGLIELMO MARCONI

Good response. The scroll wheel on the keyboard rocks.

– ALEXANDER GRAHAM BELL

No rechargeable batteries! Limited key programming options. Function lock sucks.

$120, www.microsoft.com/hardware

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MyDVD Studio Deluxe

Sonic has a tonic for burning tasks a'chronic

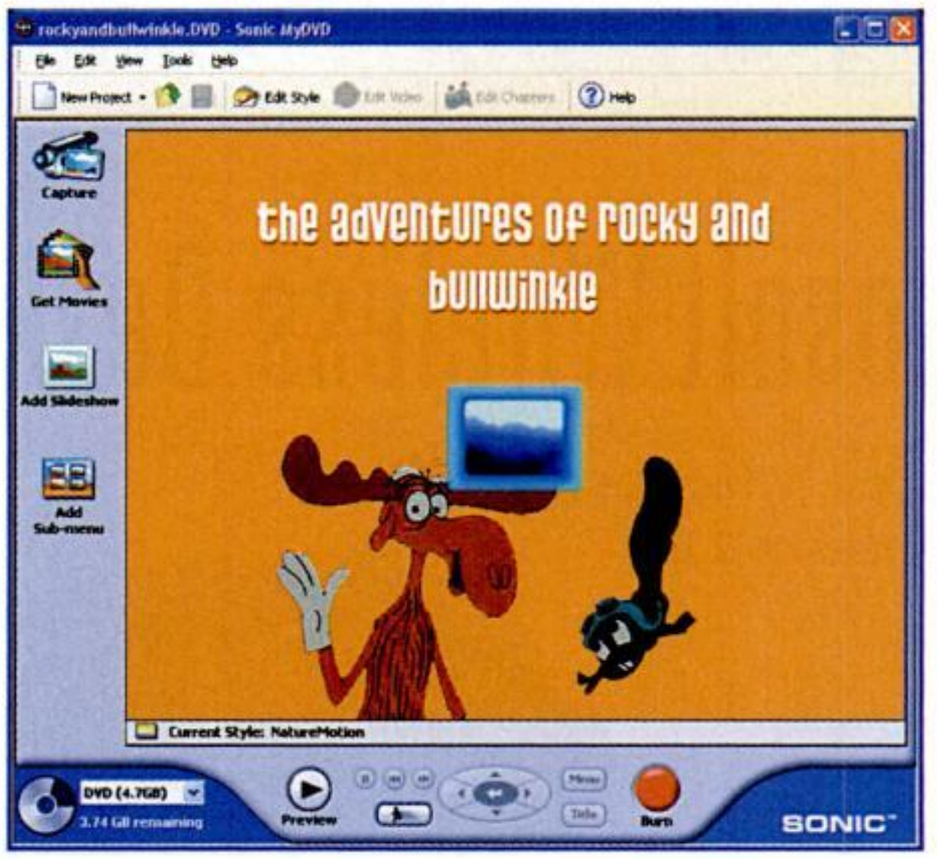
If you're going to offer a suite of software to folks who likely already own similar applications, at least one app in the package has to be truly exceptional. Sadly, there's no such application in *MyDVD Studio Deluxe*; just competent and useful software that's likely to be redundant to what you already own.

The package includes *MyDVD Deluxe 5* for making your own DVD-Video discs; *RecordNow! Deluxe 5* for all other CD and DVD burning tasks (including data backup and audio CD creation); *Cineplayer 1* for DVD-Video playback; and *Sonic Express Labeler 3* for making labels to stick on your discs so everyone will know what you've done. We put our highest hopes on *MyDVD 5*. Making DVD-Video discs with full-motion backgrounds and custom audio within *MyDVD* has been a snap since version 4, making it our preferred low-end authoring tool. But we noticed very little difference between that version and *MyDVD Deluxe 5*. The program crashes less often, which we are grateful for, and transcoding (the process of massaging audio and video into a format compliant with the DVD-Video spec) is much faster. The process of making a bare-bones DVD from 15 minutes of captured footage, using a template with a full-motion background, took just 6:12 (min:sec). That includes less than 90 seconds for administrative overhead (building the menu structure, transcoding, etc.), and less than six minutes to burn the disc using 4x DVD+R media. But you still can't position menu buttons where you want them, or make your own submenu button graphic. Argh!

There are, however, a couple surprises in the package. *MyDVD 5* now supports Dolby Digital (AC-3) audio compression to reduce audio file size (and make more room for your footage on the disc), and unlimited MP3 burning is supported by *RecordNow!*

Still, anyone who's bought a DVD burner within the last couple years probably got these applications (or their equivalents) bundled with the drive. *MyDVD Deluxe 5* remains a cut above similar products from Pinnacle and Ahead, and we might recommend it on its own, but it isn't worth the price of an upgrade.

—LOGAN DECKER



Sure we could've altered our custom background, but wouldn't it have been nice if we could just move the menu buttons where we wanted them?

MAXIMUM PC VERDICT 7

+ BURNED IN ONE TAKE

Spectacularly easy to use, and offers fancy DVD authoring features for the lowest-end price.

– BURNED AT THE STAKE

Buy this suite only if you don't already own a good CD burning app and software DVD player.

$100, www.sonic.com

Adobe Encore DVD

DVDs go DIY

Sooner or later, you're going to tire of the color-by-numbers approach taken by low-end DVD authoring apps such as *MyDVD*. And when that happens, we recommend skipping intermediate apps that shovel in a few extra features for a few hundred dollars and go directly to *Encore*.

Let's get the obvious stuff out of the way—*Encore* supplies all the basics. Full-motion backgrounds. Menu buttons that play loops of video from the chapters they represent. Simple video-editing facilities for trimming clips. Templates for cheaters.

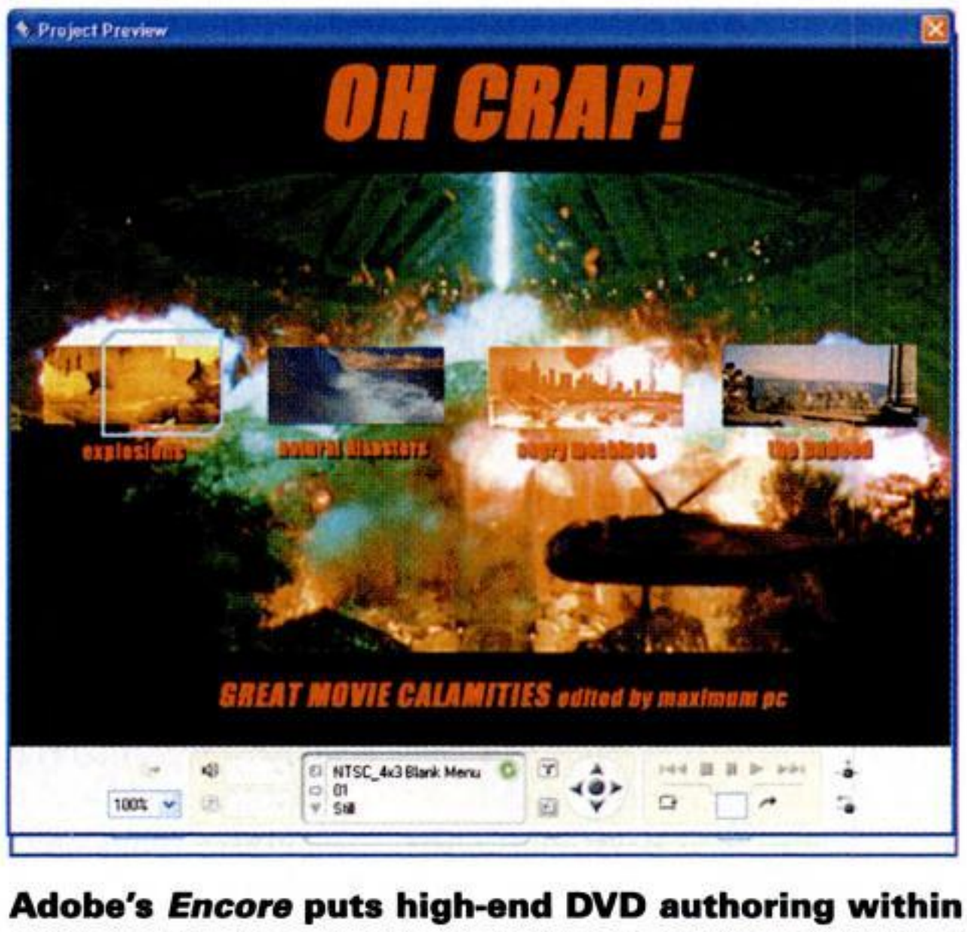
And then there's the less obvious stuff. Like the ability to add subtitles and additional audio tracks. Now, you might not need Aunt Edna's visit translated into four languages, but what a scream it would be if one track had her account of that unforgettable bus ride to Detroit, while another track had her dubbed mouthing a stream of vulgarities and off-color jokes!

But the big draw is, the close integration of other Adobe products associated with video production. Menus can be created in *Photoshop*, imported into *Encore*, and sent back to *Photoshop* for tweaking; all layers are kept intact no matter how many times you go back and forth. You can still create impressive full-motion backgrounds and animated menu buttons without *Photoshop*, however, using the built-in text formatting. Whether you use *Photoshop* or stay within *Encore*, you have virtually unlimited control over the look and feel of your DVD, from the "first play" video (the screen that's usually a stern warning from Interpol), to button placement, to even the order in which users scroll through the buttons. *Encore* doesn't ship with many templates, but we'd rather have this handful of tasteful and attractive templates than the loathsome kitchfest we see bundled with other apps.

Yes, we have gripes. The detachable and dockable palettes are clunky and take up too much space. Because buttons and submenus will likely use the same type treatment, we're disappointed that there's no way to apply a text style or save a custom color.

Still, these are manageable inconveniences in an otherwise accessible and stable app that puts creativity and innovation at the forefront.

—LOGAN DECKER



Adobe's *Encore* puts high-end DVD authoring within reach, without the fear and horror of an interface like *Premiere's*.

MAXIMUM PC VERDICT 9

+ DELETED SCENES

If you want to make pro-level DVDs, *Encore* is worth every penny.

– ANIMATED MENUS

A handful of minor issues needs attention. Some media files are inexplicably rejected.

$550, www.adobe.com

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Canon i9100

We've never seen such speed and beauty

The Epson 1280 better watch its back now that the Canon i9100 is in town.

Conventional wisdom would have us believe that it's impossible to get brilliant, accurate photo prints from an inkjet printer at anything approaching a brisk pace. Well, Canon's i9100 is now proving that notion wrong. We were able to output a 13x19 photo-quality print in less time than it took our beloved Epson 1280 to output the same photo-quality print at 8x10!

The Canon also boasts a higher top resolution than its natural competitor (4800x1200 to Epson's 2880x720), and the advantage was apparent in the prints. Fine detail content was clearly sharper in the Canon prints. The i9100's color output was beautiful, but our editors were split on the flesh-tone comparisons. Some of us preferred the slightly warmer Epson output; others liked Canon's more neutral approach. The i9100 improves on Canon's cheaper S9000 photo printer by offering borderless prints at sizes up to 13x19 (the S9000's maximum borderless is 4x6). The Epson 1280 can print borderless at up to 13x19 inches, but of course its maximum resolution can't begin to match Canon's.

Sheer speed is where the i9100 really shines. Canon says its printer can produce an 8x10 in one minute at high quality, but we found the print time to be closer to two minutes with our images. Times will always vary depending on your content, but even two minutes is much better than the 23 minutes the Epson 1280 required to print the same 8x10 image at its high-quality setting. Amazingly, the big Canon can spit out a 13x19 print in less than 7 minutes, and that's while printing borderless and at the printer's maximum resolution. Simply stupendous! Canon says its speed secret lies in the sheer number of print nozzles the printer employs. Canon specs in 3,072 nozzles, whereas the Epson 1280 boasts just 240 nozzles.

Our only gripe with the i9100 is that it doesn't come with a handy 4x6 paper cartridge, which makes shoving in a stack of paper more manageable. Canon also joins all the other companies conspiring to deny new printer owners of bundled-in USB cables. Getting a USB cable from these guys is like trying to score free floor mats from the car dealer—it just won't happen, even if you're buying a top-of-the-marquee product.

But, hey, whatever. It's impossible to dislike a printer that spits out gorgeous prints in a fraction of the time it takes the competition.

—GORDON MAH UNG

MAXIMUM PC VERDICT 9

+ WRITERS WHO SUBMIT +/- HEADINGS

Gorgeous prints in a flash.

– GORDON MAH UNG

No 4x6 cartridge. Prepare to surrender a lot of desk space to this big bertha.

$500, www.canon.com

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Savage: The Battle for Newerth

Organize or terrorize—you get to choose

***Savage's* graphical detail is lowered for netcode smoothness, but it looks decent nonetheless.**

Is it even possible for a developer to create a new game genre at this point in PC gaming history? The people at S2 games have claimed to do just that, boldly declaring *Savage* to be an RTSS—a "real-time strategy shooter." It sounds hokey, we know, but *Savage* does a great job of dividing standard team-based battle play into FPS and RTS elements, and letting you choose which way to fight.

The game is online-only, and takes place in a fantasy world that looks like a set piece for any of the *Lord of the Rings* movies. In these magical environs, humans battle beasts to gain control of large tracts of land—you know, sort of like modern-day Canada. The maps are huge and hold up to 64 people (32 players per team). Teams consist of foot soldiers on the ground playing from an FPS perspective, and a single commander controlling the action from a top-down, RTS perspective. Got it? Your team's goal is to build your own defenses and bases while destroying the other team's stronghold.

Overall, the combination of elements works quite well. Gameplay is intense, with large pitched battles taking place in several areas of the map while the commander issues easy-to-follow orders. The inclusion of humans *and* beasts adds a nice twist too, because the two species use completely different weapons and tactics.

Our only major complaint with *Savage* is the lack of an offline, bot-populated training mode. The manual contains a decent "how to get started" write-up, but we'd much prefer some type of offline, in-engine boot camp rather than having to go online and run around like a headless chicken until we figure out how the game works. It's also difficult to be Commander, as there are just two per map. In other words, if you join up and the Commander spot is taken (which it almost always is), you're out of luck unless he resigns or is voted out.

These issues are small though, and don't detract too much from the fun. *Savage* is also free of monthly charges! Whether you're an FPS or RTS fan, *Savage* is a unique game that should appeal to both crowds.

—JOSH NOREM

MAXIMUM PC VERDICT 8

+ ORCS

Nice blend of FPS and RTS, huge battles, lots of action.

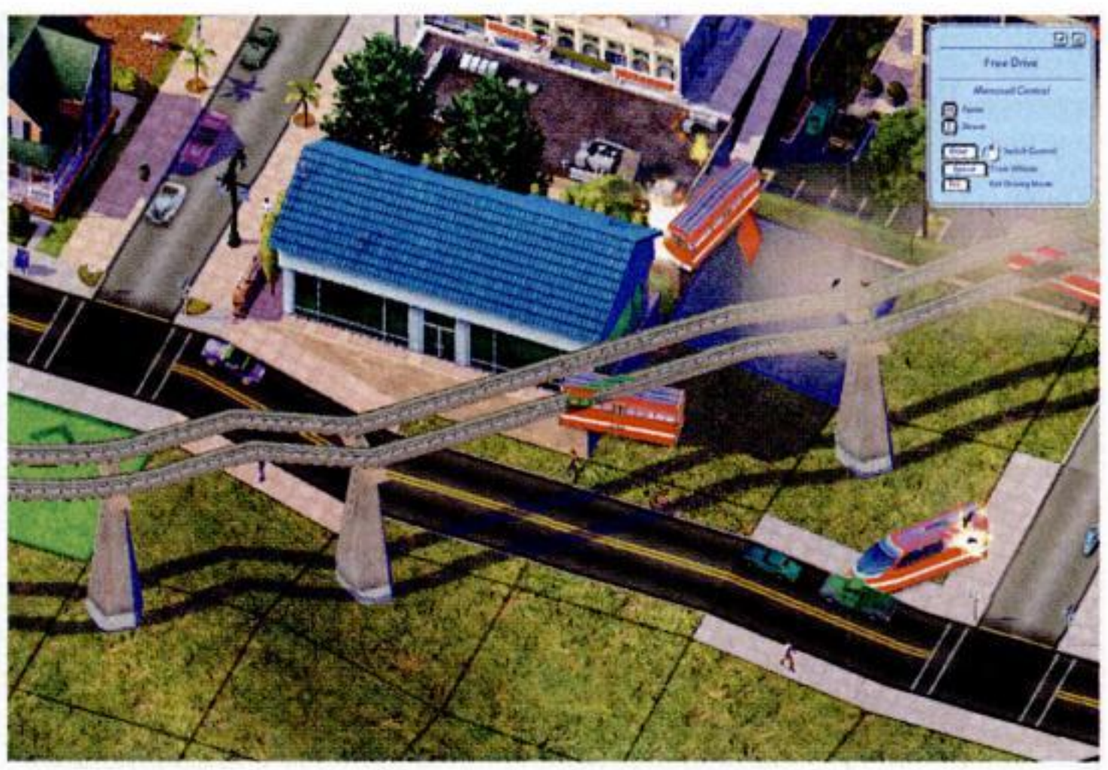
− DORKS

No official training, and near-impossible to be a commander.

$50, www.s2games.com

SimCity 4: Rush Hour

Getting around just got easier



Monorail! Monorail! MONORAIL! Just like Ogdenville, North Haverbrook, and Brockway, your city can have its own monorail.

When we first saw *SimCity 4*, we were thrilled about the game's transition from 2D sprites to a mostly 3D environment, and we loved being able to create an entire region of interconnected goodness by linking our cities to neighboring municipalities. The *SimCity 4: Rush Hour* expansion pack only adds to our delight by granting us total control over how our sims get around town.

To the standard assortment of roads and freeways, *Rush Hour* adds one-way streets, four-lane boulevards, and a bevy of new highway options. A creative mayor can use one-way streets to alleviate congestion in a busy downtown area, while Bostonians can create a Dante-esque hell of byways from which no sim could ever escape. Thankfully, the nightmarishly convoluted, automatically generated freeway intersections have been done away with; you can now choose from a wide array of intersections and other thoroughfare accoutrements.

Rail and sea enthusiasts get loads of lovin' too. With *Rush Hour*, we were able to outfit our city with a subway system, an elevated train, a *Simpsons*-style monorail, and even ferry terminals. Any mayor worth his salt will take advantage of all the transportation options to custom-tailor a mass transit system that balances budget needs and minimizes commute times.

The best feature in this *SimCity 4* add-on, however, is a new option that allows you to drive just about any vehicle in the game. Planes, trains, automobiles, and even boats can be operated via the top-down interface. This opens up loads of new challenges and missions, ranging from simple catch-the-crook police operations to more trying timed-challenges which have you racing from one location to another. The inclusion of operable vehicles adds a more traditional, and welcome, gameplay element to *SimCity 4*. Even cooler, driving around your city gives you a sim-level perspective of your town's traffic problems.

The expanded transportation options—and a set of enhanced diagnostic tools—give you new ways to troubleshoot broken cities and add even more depth to an already excellent city simulator. That said, *Rush Hour* doesn't offer much to anyone who's not into hardcore transportation tweaking.

—WILL SMITH

MAXIMUM PC VERDICT 8

+ MONORAIL

A staggering number of transportation options are available to the *SimCity* veteran.

− THE EL

This expansion is narrow, but deep. If adjusting traffic patterns doesn't sound like fun, skip this one.

$20 (with $10 rebate), www.simcity.com

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Star Wars Jedi Knight: Jedi Academy

The sword is mightier than the pen at this boarding school

The game lets you select a single light saber, a dualie, or two small sabers like these gentlemen are wielding. You can even choose the color of the beam.

LucasArts' Star Wars games have always played off our secret geeky desire to be battling for or against the Dark Side. Deep down, we're all like the "Star Wars Kid" from the Internet, waging light-saber battles in that galaxy far, far away. It's for this very reason that *Jedi Academy*—littered with characters and locations from the movies—is a must-have title for any Star Wars fan. It's by no means a perfect game, and many of the characters only make cameo appearances, but the level of immersion in the Star Wars universe is unprecedented.

The Rancor is just one of many memorable Star Wars characters that make an appearance in *Jedi Academy*.

The game puts you in the sandals of a young Padawan attending Luke Skywalker's Jedi Academy. Upon your first day of school, you discover that a sinister plot is unfolding across the universe, and you set out to become a full-fledged Jedi and confront the dark minions. Unlike previous Jedi games, you're armed with a light saber from jump street, which is a nice benefit considering that other trappings of Jedidom aren't so well implemented.

Echo, echo, echo. More than once we found ourselves staring in awe at the game's breathtaking vistas.

Jedi Academy is broken up into four chunks, with each chunk containing five separate missions. After a very brief training session, you begin your stint as a Rent-a-Jedi, flying around the universe, tackling the missions in any order you choose. Before you begin each mission, you can increase your prowess in one of eight different force powers. Four force powers fall on the light side, four fall on the dark side, and eventually you reach a pivotal plot point at which you must permanently choose a side of the force to join. This fork in the road significantly affects the outcome of the game, and adds to the game's replayability.

The developer (Raven) enhanced the Quake III engine with a few shader effects (such as a cool light-saber glow that reflects onto its surroundings), but otherwise the graphics are standard fare. Although *Jedi Academy* lacks the eye-candy of upcoming next-gen titles, textures are nice and sharp, AI is well-implemented, and there's even some ragdoll physics.

Gameplay is heavily focused on saber combat, and that's just fine with us. The duels can degenerate into blind button-mashing if you don't fully understand your force powers, but they're still loads of fun. The projectile weapons and grenades, however, are too weak to be of any real value. The missions also have you piloting a variety of vehicles, including tauntauns, AT-STs, and racing pods. Sadly, the vehicle control is so wonky, some of us ended up hoofing it to avoid frustration.

Toward the end of the game, light-saber and force skills become absolutely crucial, as you go up against hordes of cultists who simply cannot be killed with conventional weaponry. The cultists have Jedi powers, but *they* know how to use them. Herein lies a big problem with the game: It might be called *Jedi Academy,* but you receive no training on how to get the most out of—or defend against—the more arcane Jedi arts. When should you use "Force Absorb"? And how is it different from "Force Protect"? And what's the best defense against "Force Drain"? Who knows! You just have to try 'em all out, and hope for the best. Same goes for your lightsaber moves. As you matriculate through the Academy, you're endowed with new moves, but receive no instruction on how to pull them off. Hmmm. Let's see here. You're enrolled in a training academy, and you have an instructor Jedi by your side for large parts of the game, but no one ever schools you in the fine art of warfare!

Even though the single-player campaign has a few warts, multiplayer is well-rounded and a lot of fun. You can play *UT*-style Siege (one team on offense, the other on defense), go two-on-one with light sabers, or try Free For All deathmatch. You can even practice offline against bots, a feature all online games should include.

Jedi Academy isn't without its faults, but those are largely overshadowed by the game's considerable strengths. It's a mandatory buy for Star Wars geeks, and a fine, respectable romp for all others.

—JOSH NOREM

MAXIMUM PC VERDICT 8

LIGHT SABER

Killer saber duels, good mission variety, great single- and multiplayer action.

LIGHT BEER

Not enough training, and the vehicles are hard to control.

$50, www.lucasarts.com

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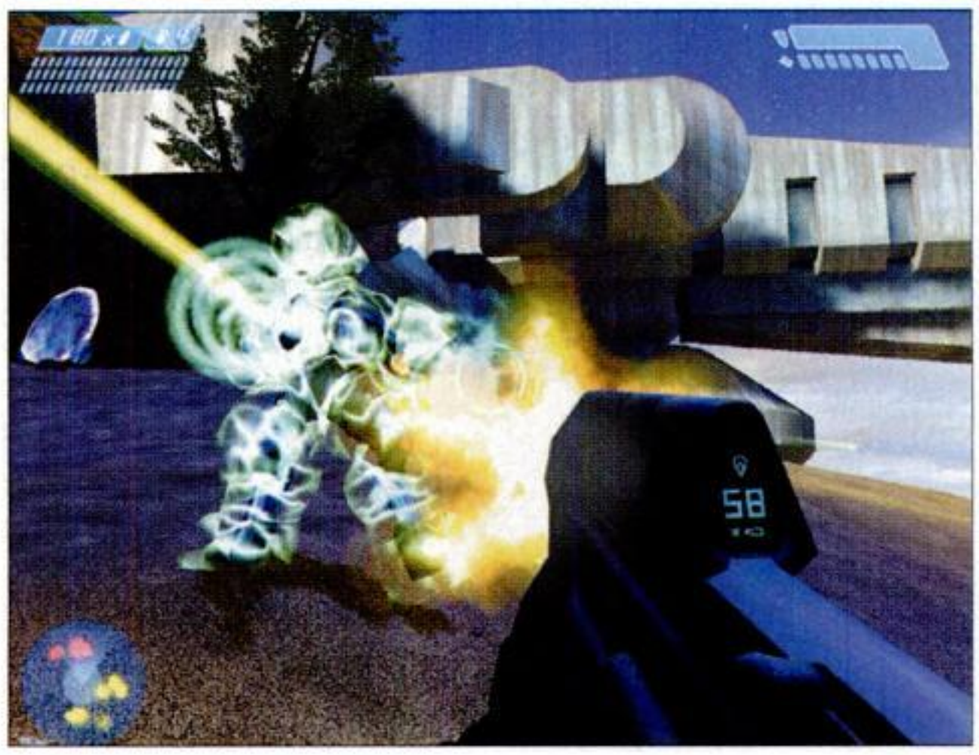
Halo: Combat Evolved

And this is the best the Xbox has to offer?



Certain weapons are more effective than others against shielded enemies.

What's left to say about *Halo*? The game, so integral to the Xbox console launch, was kept from the PC for the better part of two years, a painful length of time for slavering gamers desiring a multiplayer shooter that perfectly melds infantry and vehicle combat. So, now that *Halo's* finally arrived, how does it stand up?

Gearbox (which handled the Xbox-to-PC port) used advanced DirectX 9 shader languages to rewrite many of the DirectX 8 shaders that shipped with the Xbox version. Unfortunately, however, the overall impact on image quality is relatively minor, and the results aren't on par with today's finest PC visuals. Indeed, you'll get a more significant visual-quality upgrade by simply cranking the resolution.

We were also shocked by the game's poor performance. Even with anisotropic filtering and antialiasing disabled, we were only able to pull down about 25fps using the in-game benchmark on a high-end gaming rig.

Actual gameplay is fun, although occasionally frustrating. In addition to the normal health bar, your character also has an energy shield, which automatically replenishes during lull times. Though the shield replenishes over time, the only way to improve your health is to pick up a health pack. In extended firefights, you'll frequently find yourself ducking for cover in order to give your shield a chance to recharge. It seems like a minor gameplay annoyance, but because health packs are rare, it encourages you to play conservatively, rather than charging into new situations with guns blazing. As for the inclusion of vehicles, this once-novel feature isn't so fresh anymore—we've since become accustomed to games with better vehicle implementations, such as *Battlefield: 1942* and *Planetside*. Single-player level design can get repetitive and boring, especially in the second half of the game. We're also bummed that the best tactic for combating hordes of enemies is to run backwards, shooting blindly, not strategy and guile.

People who haven't played the Xbox version of *Halo* will enjoy this game. It has a great story, looks good, and is fun. The multiplayer is a welcome diversion—supporting up to 16 people—and tosses in a few new, larger maps. But in the big scheme of PC gaming, *Halo* isn't all that.

—WILL SMITH

MAXIMUM PC VERDICT 7

+ AA BATTERIES

Entertaining single player, novel shield/health system, and fun multiplayer with vehicles.

– D BATTERIES

Essentially unchanged from the Xbox version, and slower to boot.

$50, www.microsoft.com

Homeworld 2

Classic space RTS made better

A number of new ships have been added to the original, and all the ships are more balanced.

The original *Homeworld* did what no game had successfully done before: create a truly three-dimensional space-combat strategy game. The idea of fighting in three dimensions of space is difficult to grasp in a two-dimensional medium, but Relic achieved a nearly flawless interface that not only made such combat easy to manage and tactically rich, but cinematically stunning.

Homeworld 2 remains solidly within that tradition, tweaking and enhancing the experience but not straying too far from what made it great. In most RTS titles, the story is just the space between missions, but this series creates an engaging narrative via a blend of low-key narration and histrionic battles. Much of the narrative in *Homeworld 2* plays out like the original, with a Hiigaran mothership engaging the marauding Vagyr and uncovering secrets along the way. The audio-visual bump since 1999, however, gives the events a far more spectacular look and sound, with a truly epic sense of scale.

Make no mistake: At heart, this is a straight-up RTS with resource collection, research, ship improvements, and various classes of ships (light, heavy, fighter, bomber, and so on). What kicks *Homeworld 2* to the next level is the astounding use of spatial relationships. This feels like outer space.

While players of the original will find the game instantly familiar, many of the particulars have been improved and streamlined. The interface is now much easier to navigate, and never pops you out of the game. All commands, even research, are right on the main screen, and if you get the hang of the hot keys, you can remove the control panel completely in favor of a full-screen experience. A lot of the micromanagement of ships and fleets is gone, replaced by smart formations that correctly order various types of ships to create complex battle fleets. One particularly nice addition: Large capital ships now have different subsystems that can be targeted, so you can choose to take out engines first, then shields, and so on.

The net result of the various interface and command changes is that the experience is now easier to manage, but has become more tactically satisfying. This is a refinement to a groundbreaking gaming design: not a whole new design. That's just fine, because after four years, *Homeworld* remains a revolutionary system.

—THOMAS L. MCDONALD

MAXIMUM PC VERDICT 9

+ MATRIX

Interface and control improvements have made managing epic battles easier. Gorgeous graphics.

– MATRIX RELOADED

Three-dimensional tactics might be tough for some gamers.

$50, www.homeworld2.com

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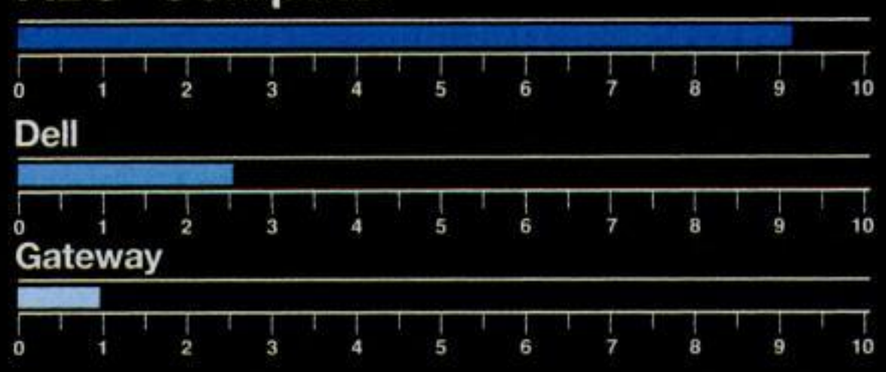

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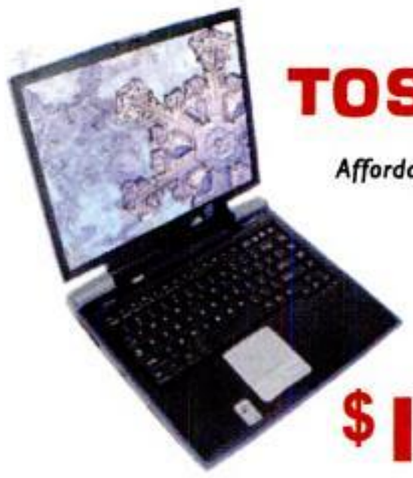

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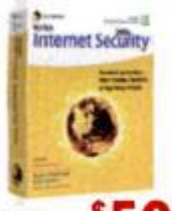

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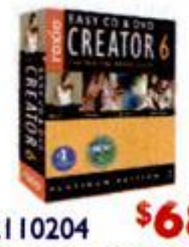

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- 16X DVD-ROM & 52X24X52 CD-RW Drive
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- Creative Cambridge Desk Top Theater 5.1 S560 5.1 Surround Sound System
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- 16X DVD-ROM
- Creative Lab SB Audigy 2 ES 7.1 w/1394 IEEE
- Creative Inspire S560 5.1 Surround Sound System
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- Creative Lab V.92 Fax Modem w/ Voice
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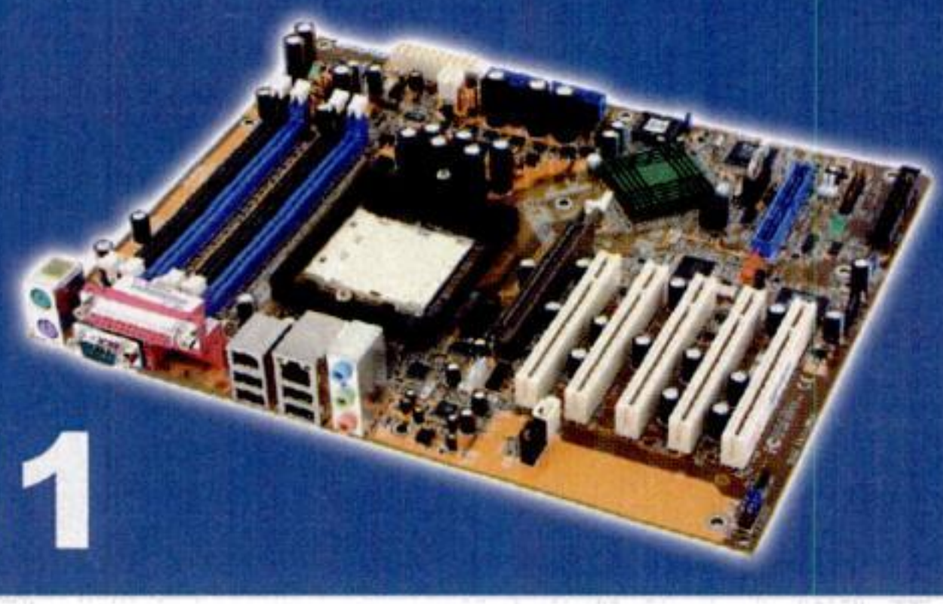

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AMD 64

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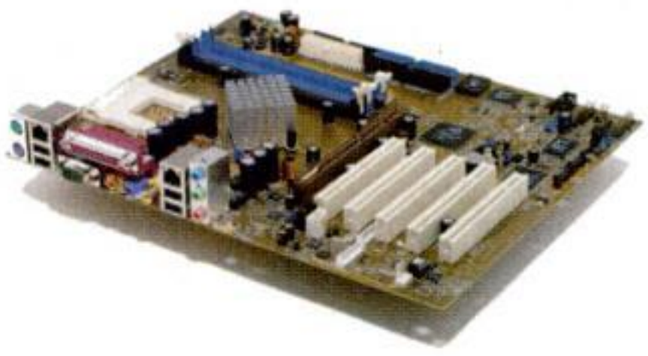

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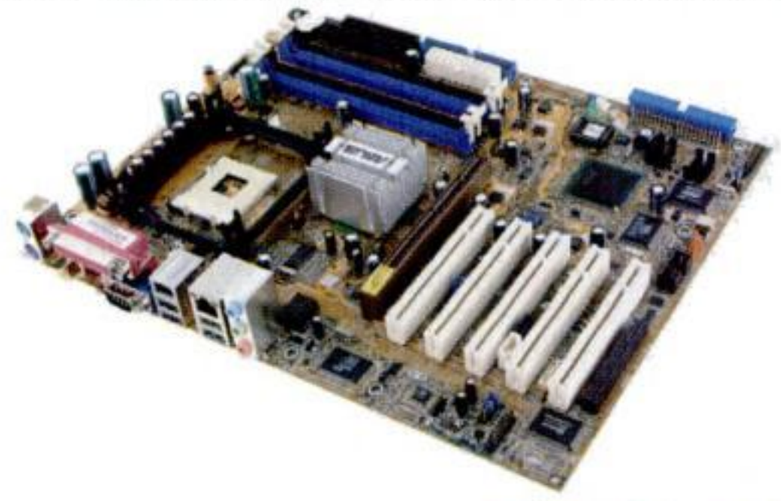

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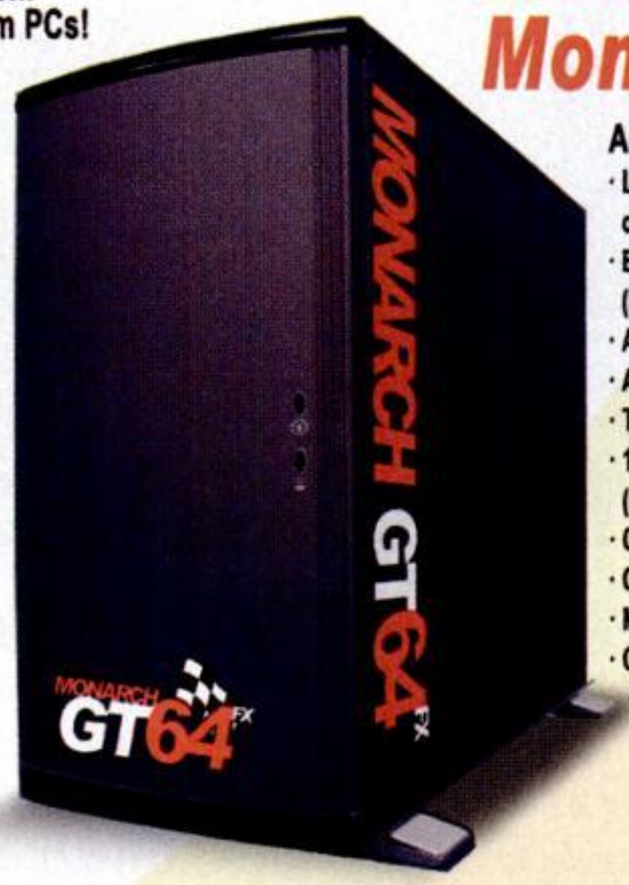

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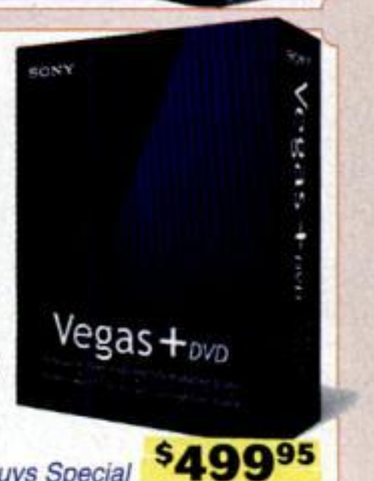

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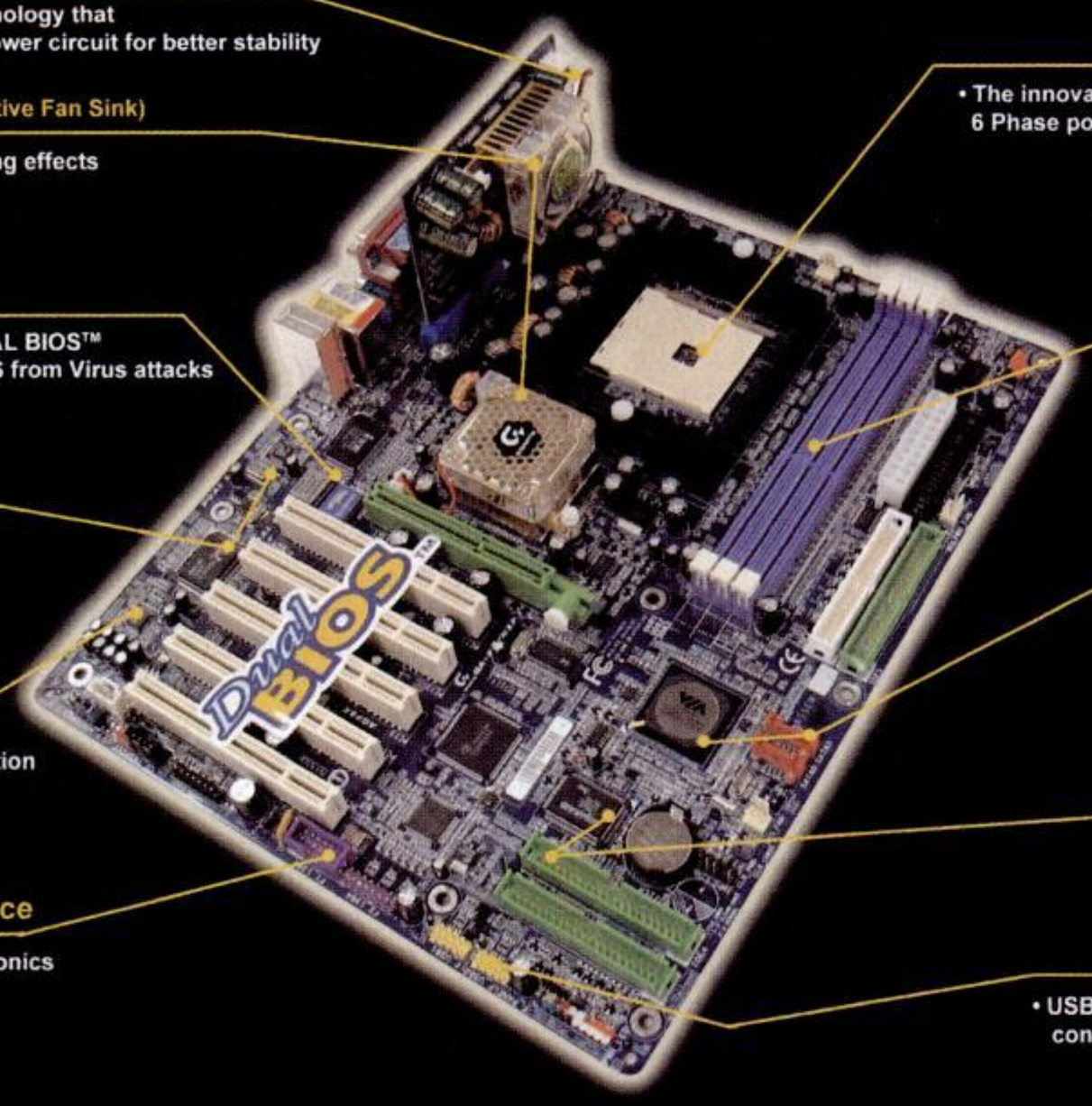

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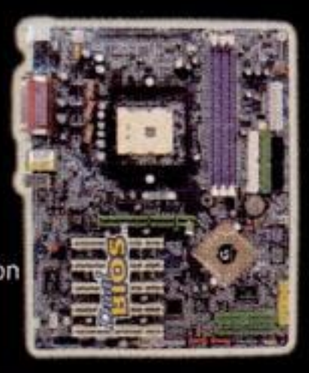

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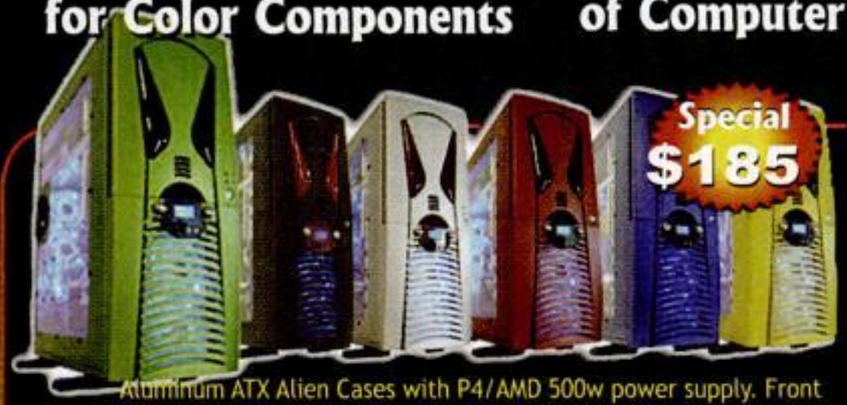

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ATI	100435002	Radeon 9800 Pro 128MB DDR 8x AGP	$394
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Sound Cards Step 7

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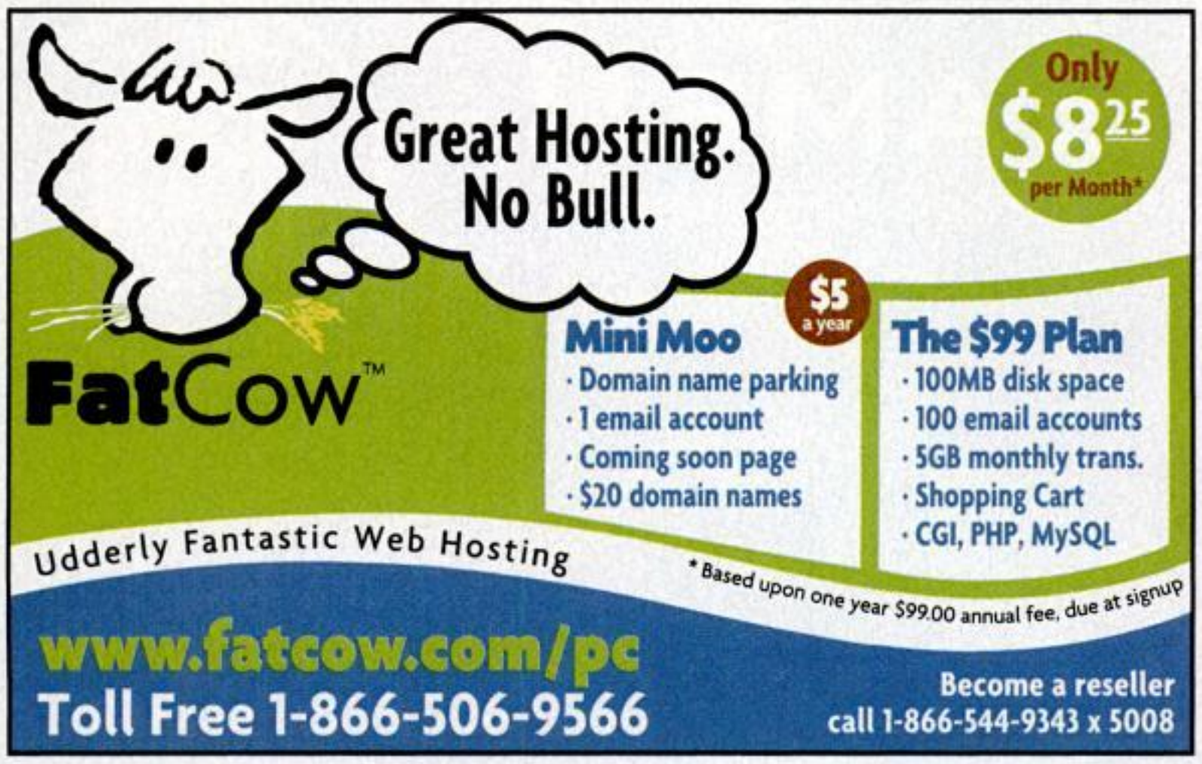

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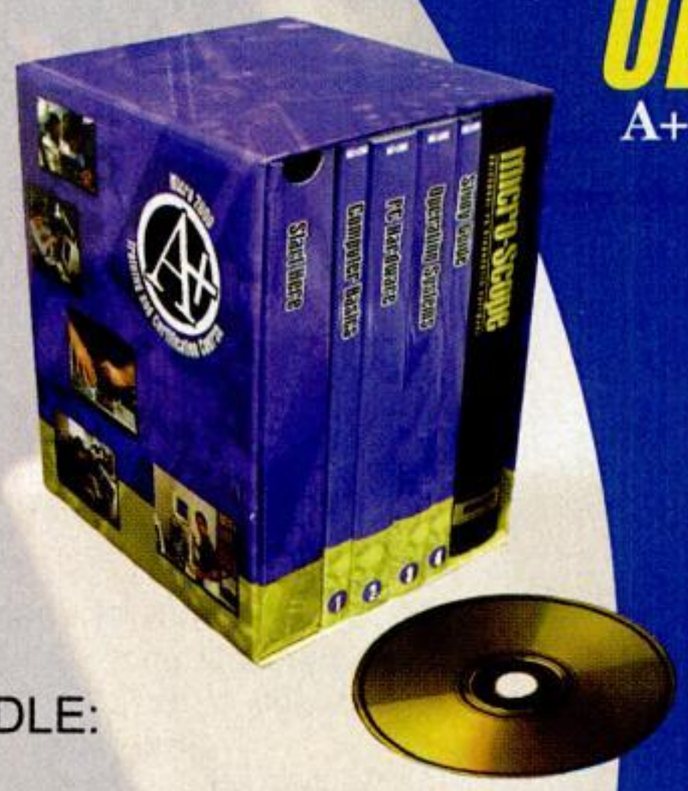

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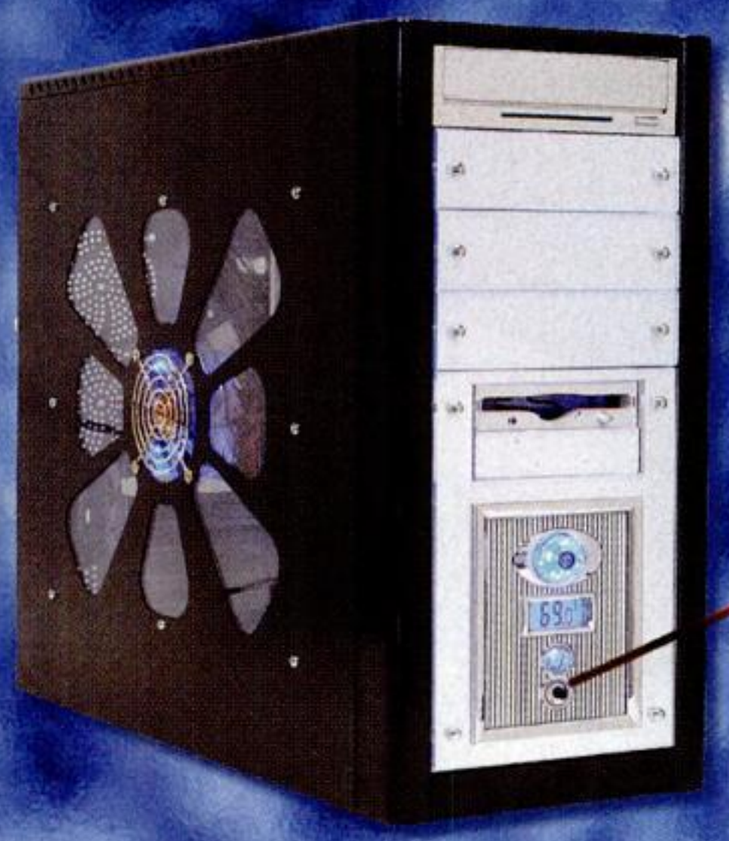

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WIN Rig of the Month and Win Big!

If your modded PC is chosen as a Rig of the Month, it will (1) be featured before all the world in *Maximum PC*, and (2) win you $1,000 and a case of BAWLS high-caffeine soft drink. So what's stopping you?

TO ENTER: Your submission packet must contain your name, street address, and daytime phone number; no fewer than three high-res JPEGs (minimum size 1024x768) of your modified PC; and a 300-word description of what your PC represents and how it was modified. E-mailed submissions should be sent to **rig@maximumpc.com**. Snail mail submissions should be sent to Rig of the Month, c/o Maximum PC, 150 North Hill Drive, Suite 40, Brisbane, CA, 94005.

The judges will be *Maximum PC* editors, and they will base their decision on the following criteria: creativity and craftsmanship.

ONE ENTRY PER HOUSEHOLD. Your contest entry will be valid until (1) six months after its submission or (2) May 1, 2004, whichever date is earlier. Each month a winner will be chosen from the existing pool of valid entries, and featured in the Rig of the Month department of the magazine. The final winner in this contest will be announced in the July 2004 issue. Each of the judging criteria (creativity and craftsmanship) will be weighed equally at 50 percent. By entering this contest you agree that Future Network USA, Inc. may use your name, likeness, and web site for promotional purposes without further payment. All prizes will be awarded and no minimum number of entries is required. Prizes won by minors will be awarded to their parents or legal guardians. Future Network USA is not responsible for damages or expenses that the winners might incur as a result of the Contest or the receipt of a prize, and winners are responsible for income taxes based on the value of the prize received. A list of winners may also be obtained by sending a stamped, self-addressed envelope to Future Network USA, Inc., c/o Rig of the Month, 150 North Hill Drive, Brisbane, CA 94005. This contest is limited to residents of the United States. No purchase necessary; void in Arizona, Maryland, Vermont, Puerto Rico, and where prohibited by law.

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MAXIMUM PC Rig of the Month

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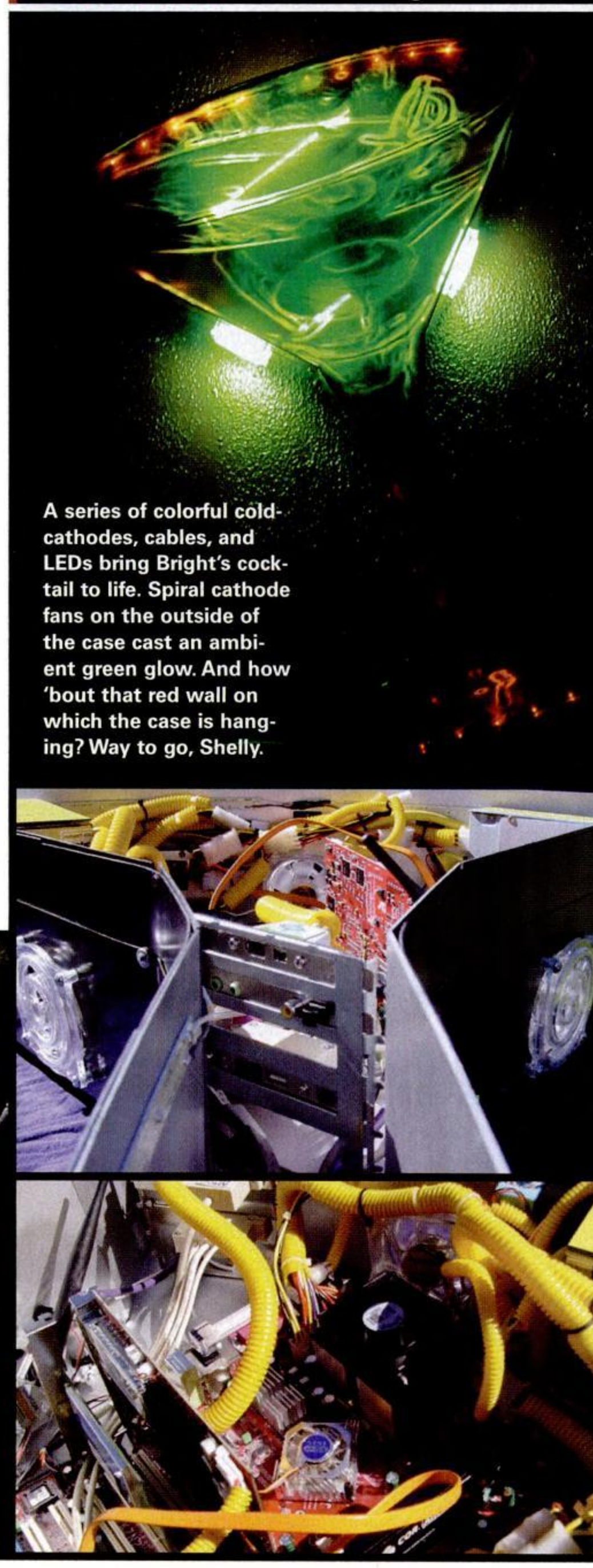
THIS MONTH: Sheldon Bright's Martini Glass

When you step inside Sheldon Bright's living room, you know you're in for a good time. The guy's got a 3-foot, neon-lit, martini glass on his wall, for Pete's sake! It's not just for show, either. The stylish aluminum-and-Plexiglas sculpture artfully conceals a no-holds-barred entertainment center PC, replete with an Athlon XP 3200+, ATI Radeon All-in-Wonder 9700 Pro, 120GB Seagate S-ATA hard, and Sony DVD-CD/RW drive. That's quite a cocktail of components.

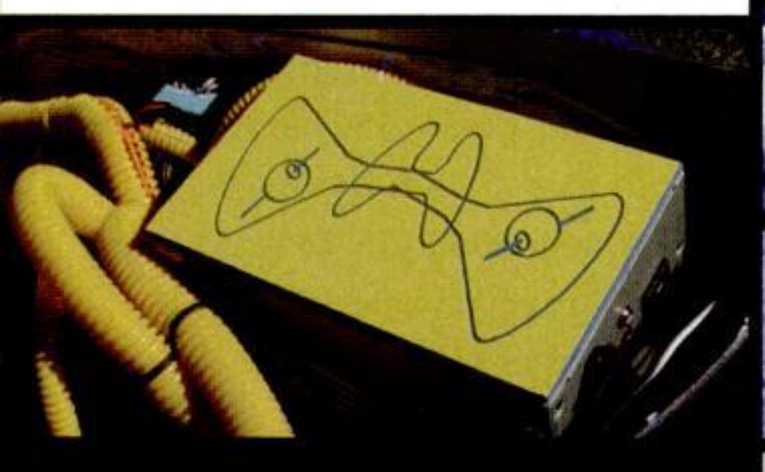
It's no surprise that Mr. Bright's a veteran of the sign industry. Few others would have the know-how and resources to execute such a project. For starters, Bright photographed a real-life martini, tweaked the image to his liking in *Coral*, and then vectorized the artwork. Sheets of thin aluminum were cut to scale on a router table, and then fed into an Accu-Bend machine programmed to manipulate the metal into its present form (notice the graceful curves and contours of the case's profile).

An instrument known as a Gerber Edge was used to print an image of the martini onto clear vinyl, which was then applied to the Plexiglas case-face much like any appliqué. When the computer's powered on, the whole kit-and-caboodle lights up like Dean Martin on a three-day bender. When the computer's off, the innards of the case are just barely visible beneath the visage. It was important to Bright that, on or off, the case make for an attractive piece of wall art.

In his words: "I wanted something that could be placed in my living room and actually accent the style of the place... not scream out, 'big geek lives here'."



A series of colorful cold-cathodes, cables, and LEDs bring Bright's cocktail to life. Spiral cathode fans on the outside of the case cast an ambient green glow. And how 'bout that red wall on which the case is hanging? Way to go, Shelly.



"In the end, it was all about stealthing," says Bright. That's evident from his crafty positioning of all the componentry. Still, the interior's not all about organization. The martini motif is carried through to the engraved acrylic surfaces of both the PSU and DVD drives.

For his winning entry Sheldon Bright wins $1,000 and a case of BAWLS to fuel his late nights of modding. You can win too! See previous page for contest details.

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